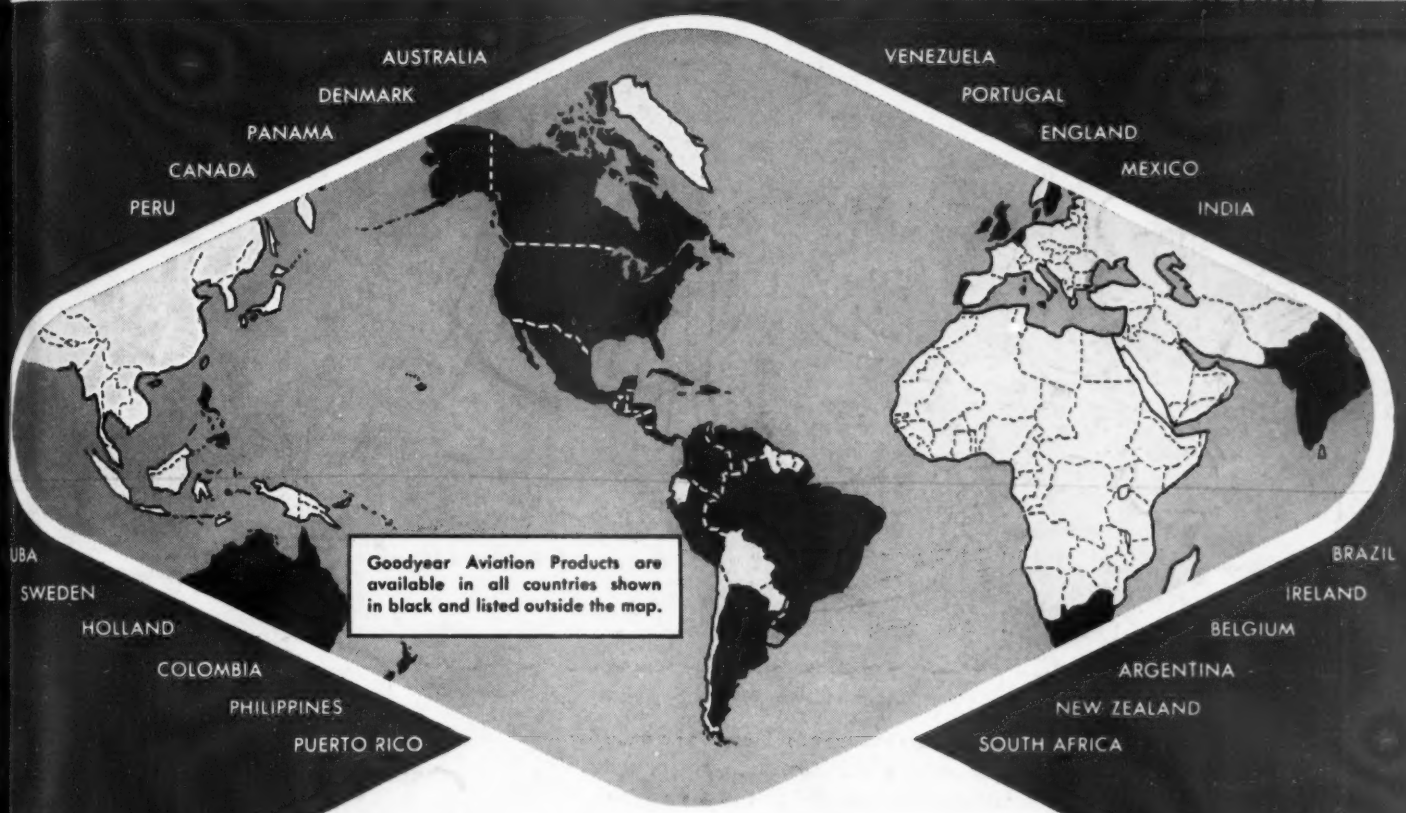
AVIATION WEEK
A McGRAW-HILL PUBLICATION
MAY 31, 1948



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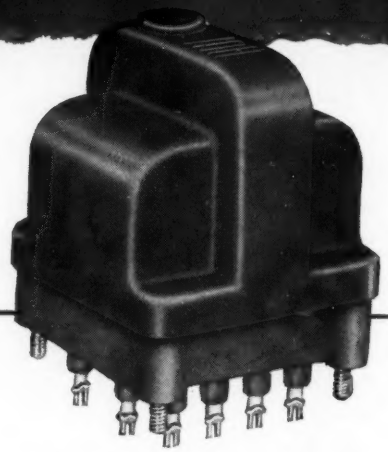
FROM arctic to tropic conditions within a matter of minutes is an everyday occurrence for many aircraft. Ordinarily, a result of such sharp, sudden changes would be rapid deterioration of the transformers in a plane's electronic equipment. But here, Honeywell Creative Engineering anticipated the need for special protection—and developed the answer.

The transformer housing of all-phenolic plastic combines light weight, high arc resistance, low moisture absorption and strength. A varnish-like seal guards every layer of insulation against break-down. And finally the entire unit is completely impregnated with a black wax. The result is a transformer unaffected by ten-cycle tests of half-hour immersions in first boiling water, then ice water.

Here again is practical evidence of Honeywell Creative Engineering at work. It accounts for the reason why all Honeywell aeronautical controls promote improved efficiency with minimum maintenance—and are recognized for their dependability. Minneapolis-Honeywell, Minneapolis 8, Minnesota. In Canada: Toronto 12, Ontario.



In a Laboratory "Jungle"...

Honeywell Creative Engineering developed this transformer housing that effectively resists dirt, dust infiltration and damaging moisture condensation.

CREATIVE ENGINEERING

MINNEAPOLIS **oneywell**

AERONAUTICAL CONTROLS

Makers of the Famous M-H Electronic Autopilot Standard on all AAF 4-Engined Bombers

GOING UNDERGROUND FOR A "WHIRL"

▶ This aircraft turbine wheel is about to undergo a "whirl test"—a test to prove its ability to survive the tremendous centrifugal forces present while it spins at supersonic blade tip speeds.

▶ The test is conducted in an underground chamber from which the air is evacuated. This permits the wheel to whirl at higher speeds than required in service . . . for if the blades had to push air around at such speeds, enormous power would be required to drive the wheel. To detect any slight irregularity that might occur during the run, the test rig has an electronic indicator.

▶ Because some experimental parts are whirled to destruction to determine how much overspeed they can endure, the chamber is lined with laminated boiler plate—12 inches thick.

▶ Each newly designed turbine wheel, compressor, and supercharger impeller must prove its ruggedness in similar tests in the Wright Aeronautical research laboratories before being released for production.

▶ Another example of the painstaking research behind the development of Wright aircraft turbine and reciprocating engines.

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Axelson is currently producing superchargers for cabin pressurization of the Douglas DC-6 airplane. Numerous Axelson experimental projects are under way, in design stage, production stage and on actual operating tests. Axelson engineering maintains constant research to provide more efficient equipment, combining economy with finest quality.

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AVIATION WEEK

Vol. 48 No. 22 — May 31, 1948

News Digest	6	New Products	27
Sidelights	9	Sales & Service	29
Headline News	11	Briefing for Dealers	31
Aviation Calendar	16	Financial	32
Industry Observer	16	Transport	33
Engineering-Production	17	Letters	42

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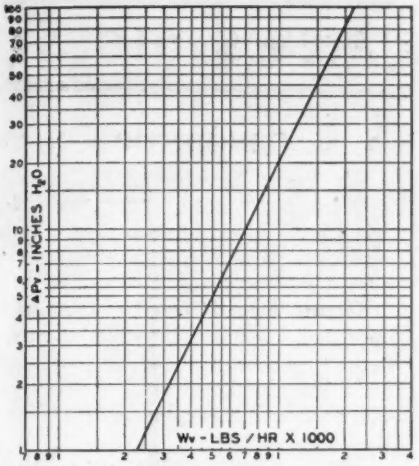

S-300 Model: Ventilating Air Flow-W, Vs Ventilating Air Pressure Drop —ΔP_v, Isothermal at Sea Level. Barometer: 28.55" Hg. Av. Temp: 101° F.

character study

Here's the new Janitrol Series S-200 aircraft heater—standard 200,000 Btu/hour model. Low ventilating air pressure drop (see chart at left); light weight; compactness: 22.8" long, 10" diameter; easy accessibility (change spark plugs without removing heater); new combustion chamber of special heat resistant corrugated Inconel; welded gas tight throughout; dual—stand-by positive spark ignition—these are some of its many tested features that have already earned acceptance on such planes as the Douglas DC-3 and C-119, and are chalking up high records for safe, dependable operation, minimum maintenance, and long life. Ideal for either new planes or for converting older military and commercial planes to modern heating efficiency. Write for case histories on maintenance savings effected by leading airlines with the S-200 on DC-3s, utilizing existing ductwork.

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NEWS DIGEST

DOMESTIC

Air Force Strategic Air Command will move its headquarters to Offutt Air Force Base, Omaha, Nebr. from Andrews Field, Md. in the next 90 days.

Senate Armed Services Committee approved a bill authorizing the government to place additional surplus plants on a standby basis. The move would affect about 250 surplus plants still held by the government.

Establishment of the Civil Air Patrol as a permanent volunteer civilian auxiliary of the Air Force was approved by the Senate last week. The bill would permit CAP use of Air Force fields, oil, fuel and supplies.

Convair-Liner will enter first scheduled passenger service tomorrow on American Airlines' Washington-New York, Washington-Chicago and Washington-Charleston-Cincinnati-Indianapolis-Chicago routes. The Convairliner has already flown a 100,000-mile transcontinental cargo schedule and hundreds of familiarization flights throughout the American Airlines system over the past few months.

FINANCIAL

Lockheed Aircraft Corp. announced sales totaling $32,835,352 for the first quarter ending Mar. 31, compared with $19,073,704 for the same period last year.

United Aircraft Corp. showed net income of $3,248,230 or $1.10 per share for three months ended Mar. 31.

McDonnell Aircraft Corp.'s net income for nine months ended Mar. 31 was $814,606 or $3.50 a share.

Republic Aviation Corp. reported profit of $1,377,254 before taxes for first quarter of 1948 on sales of $14,374,928.

Boeing Airplane Co. operated at a net loss of $34,615 during first quarter of 1948. Sales amounted to $19,302,932.

FOREIGN

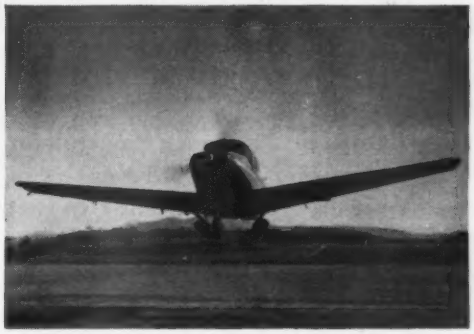
Panair do Brasil will increase its Lockheed Constellation through service between Rio de Janeiro and Buenos Aires from two to three round trips per week to accommodate the increasing travel over the route. The six-hour flight is proving increasingly popular with the debut of the Connies.

Chartered planes will fly airmail to "somewhere" in the new state of Israel "at the sender's risk" by the Jewish agency. U. S. Post Office suspended airmail to Palestine a month ago.

BIGGER, MORE USEFUL; SAFE, FAST AND RUGGED

HERE'S THE BEAUTIFUL new 1948 *Ryan Navion* in Catalina Tan, one of four brilliant enamel colors now available. Among other new features in 1948 are draft-free ventilation, improved interior styling, perfected sound insulation and a new, improved fuel system. Many mechanical refinements have been made in plane, engine and propeller.

PLENTY OF LEG AND ELBOW ROOM for 4 passengers and their baggage in the *Ryan Navion*. Seats are removable to hold 645 lbs. of cargo in 55 cubic feet, easily loaded by removing canopy. Leg room is 50 inches in front and 40 inches in back. Elbow room is 42 inches, and baggage compartment holds up to 180 pounds in 20 cubic feet of space.



IN AND OUT OF SMALL FIELDS with the greatest of ease! You never believe how easy it is to fly this big, fast plane until you actually try it yourself. For illustrated booklet and a free trip in the *Ryan Navion*, write us on your business letterhead. We'll have our nearest dealer put a *Navion* at your disposal for a business or pleasure trip.

NAVION LOGICAL NEXT STEP FOR 2-PLACE OWNERS

Actually much easier to fly than many 2-place planes, the new 1948 *Ryan Navion* is the ideal next step for the small plane owner who recognizes the need for top cross-country performance and real business-plane utility.

The 1948 *Ryan Navion* has not sacrificed ease of flying in order to obtain its 150-mph speed or its roomy 4-passenger comfort. Its interconnected ailerons and rudder give an optional coordinated two-control system, assuring stability and relaxed flying even in rough air. Unique all-around visibility makes every maneuver...in the air and on the ground...easier...safer.

The *Ryan Navion* is designed to "go places" *fast* and to land you wherever business or pleasure requires. Hydraulic flaps, sturdy tricycle landing gear with oversized wheels and tires, and the large steerable nosewheel, assure efficient operation from short, rough fields, even in strong cross winds. The powerful 185 hp engine gives the *Ryan Navion* a climbing rate of 830 feet a minute, and normal range of 500 miles. The new optional auxiliary tank gives it a maximum range of 750 miles.

Safety and dependability are built into the *Ryan Navion*; its thick-skinned all-metal ruggedness means not only extra strength but permanent beauty and ease of maintenance.

Owners seeking the best will find that the new 1948 *Ryan Navion* has blended together all the characteristics most desired in 4-place planes, no unbalanced extremes in performance have been sought at the sacrifice of other important qualities.

The Thoroughly Proven Post-War Plane *Ryan Navion*

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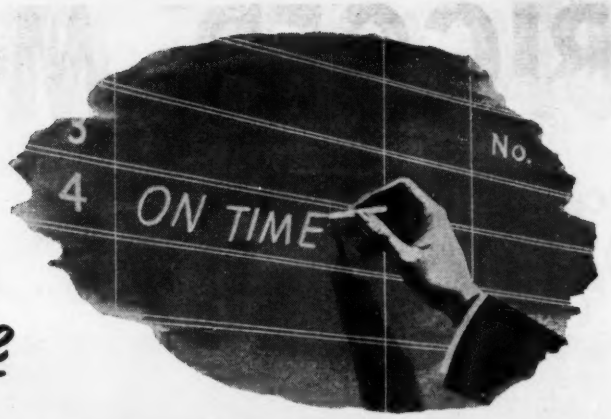

Confidence in airline operation pays off... in bigger payloads... bigger profits. Sperry helps airlines *build confidence* by supplying equipment that pays off, too . . . in greater schedule reliability . . . greater public confidence in commercial flying.

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NEWS SIDELIGHTS

Carrier War

Air Force-Navy battle over the 65,000 ton carrier continues. General Carl Spaatz denies that the Joint Chiefs of Staff, of which he is a member, approved the carrier since he, himself, refused to go along with the idea.

Admiral Louis Denfeld had previously told the House Armed Services Committee that the Joint Chiefs, whose decisions must be unanimous, had approved the super carrier program.

Spaatz further told a gathering of several hundred newsmen last week that he did not believe that carrier aviation could stand up against land-based aviation in an attack against a large land mass.

NAL Strike Board

The emergency fact finding board appointed by President Truman in an effort to settle the National Airlines pilot strike discovered in the first few minutes of hearings that it had an exceptionally tough nut to crack.

NAL attorneys contended the board was created under a "misapprehension".

The Presidential order setting up the panel said the NAL pilot dispute, in the judgment of the National Mediation Board, threatens to interrupt interstate commerce to a substantial degree. The carrier told the emergency board it knows of no such threat to interstate commerce since it has restored service to all points and there is no dispute between National and its present pilots.

NAL indicated that if there is a threat to interstate commerce it lies in the Air Line Pilots Association's plans to spread the walkout to other airlines not parties to the emergency board's investigation. National and other carriers want to know what ALPA told the National Mediation Board which stirred that body to suddenly discover a "threat" to interstate commerce in a dispute now nearly three years old and only after a strike had approached its fourth month.

Tobey's Rebuttal

Sen. Charles Tobey (R., N. H.) takes issue with a report here (AVIATION WEEK, Apr. 19) that as acting chairman of Senate Interstate and Foreign Commerce Committee he worked behind the scenes to have Sen. Owen Brewster (R., Me.) deposed as chairman of the aviation subcommittee. Tobey declared "there isn't a word of truth in it", but conceded that he and Brewster see eye to eye on few, if any, issues.

Tobey reported that this would not prompt him to deprive his Maine colleagues of prerogatives his seniority and service merit, and pointed out that while he served as acting chairman he referred the four aviation bills that came up for consideration to Brewster's subcommittee. Sen. Wallace White (R., Me.), following an illness, has returned to take over the Senate Interstate chairmanship.

Latest XS-1 Report

Latest official report on the Air Force's news policy concerning Bell XS-1 speed was revealed last week by Stephen Leo, Air Force public relations chief, who told an audience of several hundred newsmen at the National Press Club that: "The Air Force is not authorized to discuss the matter. Answer to the question of XS-1 performance will have to come from the Justice Department."

General Hoyt S. Vandenberg had ducked the question put to him by a Washington newsman and deferred to Leo for reply. General Carl Spaatz, co-speaker on the program, similarly refused comment.

Commercial Dirigibles

For the first time a lighter-than-aircraft developmental program is getting sympathetic attention by Congress. Chairman Owen Brewster (R., Me.) of the aviation subcommittee of Senate Interstate and Foreign Commerce at a hearing last week suggested that the Army, Navy, and Air Force have deprecated airships to prevent funds for their development from being diverted from other transportation media—a view heartily concurred in by the two witneses, Vice Adm. C. E. Rosendahl, formerly in charge of airship development for the Navy, and F. W. Litchfield, president of Goodyear Aircraft, both long-standing lighter-than-air enthusiasts.

Both supported the plan of legislation, sponsored by Brewster, to direct the Maritime Commission to undertake airship development, and recommend a five-year $50,000,000 program, involving two 10,000,000-cubic-feet rigid ships.

NACA Changes

President Truman moved last week to strengthen the scientific membership of National Advisory Committee for Aeronautics by appointing Theodore Paul Wright to a full five-year term as a civilian member. He takes the place left vacant by the death of Dr. Orville Wright.

Simultaneously, Delos Wilson Rentzel was appointed to serve the place vacated by Ted Wright, that of Department of Commerce representative serving throughout his term as CAA administrator.

Addition of two more scientific members to the committee appears certain with House Military Affairs Committee approval of a bill to increase NACA to 17 members, and favorable Senate sentiment on a similar bill. Although non-government members are chosen for their professional knowledge and not as representatives of their respective industry connections, this increase in NACA's scientific membership will further insure its independence and technical competence in the field of aeronautical research.

Postal Buck Passed

It now appears likely that Congress will toss the controversial matter of postal rate increases to boost revenue and put the Post Office Department on a self-sustaining basks back to the department. House Post Office and Civil Service Committee has approved legislation setting up a three-member board in the department to submit to Congress each January a schedule for postal rates in all categories which would assure revenue equal to expenses. The Board's schedule would become effective unless vetoed by Congress within a 60-day period. Air Transport Association is opposed to the legislation. Executive Vice President Robert Ramspeck objects that, since numerous postal services are admittedly for the "public benefit" and are non-compensatory, a rate schedule assuring revenue equal to outlay would necessarily mean that airmail and other first class mail rates would have to reflect costs incurred for the non-compensatory services.

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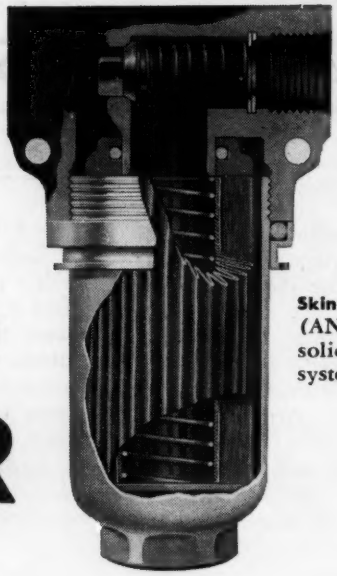

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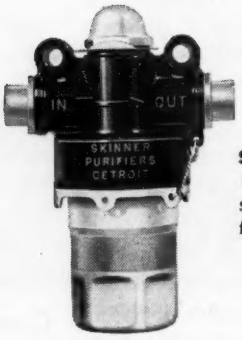

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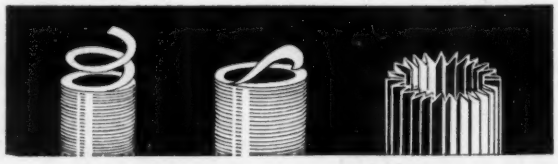

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Bendix AVIATION CORPORATION

Vol. 48, No. 22

AVIATION WEEK

May 31, 1948

All-Weather Airways Gains More Ground

Commerce and Defense Departments agree on board to develop billion-dollar system.

By Robert Hotz

Administrative pattern of the proposed billion dollar all-weather airways system began to emerge in Washington last week.

Basic control of the system will be vested in the National Defense Establishment through an Air Navigation Development Board charged with primary responsibility for all research and development work for the program.

▶ **Joint Agreement**—This board was established by agreement between Defense Secretary James V. Forrestal and Secretary of Commerce Charles Sawyer based on recommendations by the Research and Development Board's ad hoc Committee of Navigation headed by Ralph Damon, president of American Airlines.

The ANDB will be a three-man group with representatives of the Air Force, Navy and CAA. It will operate for housekeeping purposes only within the Department of Commerce. Eventually this board will be aided by an executive director and a "system engineering group" of technical experts.

Final details including voting procedures, are being established by a temporary working group consisting of B. A. Denicke (CAA) Capt. Felix Baker (Navy) and Col. S. A. Mundell (USAF). The permanent ANDB will be the final arbiter on equipment and procedures to be used in the joint-military civil all-weather airways program. Another permanent navigation committee will be organized by the military Research and Development Board to supervise land and marine navigation programs in addition to monitoring the airways program.

▶ **ACC Group** – Complementing the work of the ANDB will be permanent air navigation committee of the Air Coordinating Committee. Makeup of this group has not yet been finally approved by ACC but will probably consist of voting representatives from CAA, USAF, Navy, FCC and Coast Guard with non-voting representatives from Airline Owners and Pilots Association; Air Line Pilots' Association and Air Transport Association.

The ACC group will be responsible for determining operational requirements of equipment needed for the all-weather airways program while the ANDB will be responsible for evaluating these requirements in light of additional national defense needs and making a final decision. Final determination of the types of equipment and their use will rest with ANDB. In general the military will present its non-tactical requirements (principally for strategic air transport) through the ACC group and its tactical requirements for air defense and combat operations through the ANDB.

▶ **Veto Still Issue**—Big issue is whether the ANDB will have veto power over the ACC navigation committee requests for specific equipment.

Both groups will be guided, but not bound by, the recent report of the Radio Technical Commission for Aeronautics special committee No. 31.

▶ **Special Studies**—Already two new special committees have been organized to study specific problems arising out of the all-weather airways program. One group is concerned with distance measuring equipment. The other is determining whether the private line visual air-ground communications required by the new airways system should be combined with airborne radar identification beacons. Results of these studies will be referred to the ACC navigation committee and ANDB for final decisions.

The complex interdepartmental relations involved in the all-weather airways program are by no means finally determined. Considerable conference room skirmishing between the agencies remains before the final administrative pattern will be set.

▶ **Funds Detailed**—The RTCA SC-31 report earmarked $75,000,000 of the proposed $1,113,000,000 total cost of the all-weather airways system for research. This $75,000,000 would be controlled by the ANDB while the ACC navigation group would supervise expenditure of $1,038,000,000 for production equipment to be used in the system. RTCA estimated that military share of the equipment program would come to $789,000,000 with $124,000,000 as the civil agencies' share.

RALPH DAMON'S committee untangled administrative knot that tied progress.

New Designations

Air Force has approved changes in its aircraft type designations, changing the total from 30 to 12 and using type names considered more descriptive of the function of the individual types. In implementing the new directive, the numerical order of existing designations will be continued, as: F-86A, TF-80C, and so on. New and old designations follow:

Type	Old	New
Fighter	P	F
Reconnaissance	F	R
Trainer	AT, BT, PT	T
Search and rescue	None	S
Research	XS	X
Amphibian	OA	A
Helicopter	R	H

Other designations are unchanged: B, bomber; C, cargo; G, glider; L, liaison; and T, target and drone.

Size of Air Force Remains in Doubt

President hints he will not spend all of procurement funds; Vinson says operational budget is insufficient.

The Truman administration is still strongly opposed to the Air Force program despite its overwhelming support in Congress. Last week the President found two ways to clip the Air Force's wings:

- His Budget Bureau proposed funds for fiscal 1949 operations far short of USAF requirements.
- He signed the $3,198,100,000 procurement bill with a plain hint that he does not feel bound to okay expenditure of that entire amount.

At the Capitol, Rep. Carl Vinson (D., Ga.), ranking minority member of the House Armed Services Committee, disclosed that the budget sent to Congress for Air Force maintenance, manpower and operations is more than $100,000,000 shy of what is needed to keep 66 groups flying.

At the White House, President Truman signed the appropriation bill saying, "Congress has seen fit to provide $822,000,000 beyond the amount which I considered necessary in submitting my request for the acceleration of the program.

"Provision is made, however, that the funds shall not be spent without a finding by the President that the 'contracts let are necessary to the national defense' and that the procurement results in 'maximum utilization of improvements in aircraft and equipment consistent with the defense needs of the United States.'

"To assist me in discharging this responsibility, I have asked the Secretary of Defense and the director of the Bureau of the Budget to formulate and recommend appropriate procedures. . . I intend to review the entire military program in September and again in December. Our national security requires that the total national defense program be based on a strong economic system and depend on a level of expenditures which can be supported in subsequent years."

To some, that was clear warning that the Air Force's 70-Group program was being thrown out the window. The $822,000,000 mentioned by the President was the additional amount authorized by Congress for procurement sufficient to build up the Air Force to 70 groups.

Last January the Administration proposed 55 groups. Forced to back down on that, it since has clung staunchly to 66 groups as the size of the permanent Air Force.

Whether that size is possible, even temporarily, last week was in doubt.

► **Budget Request**—Under its old 55-Group concept, the Administration asked $689,692,000 for Air Force operations in fiscal 1949. When it upped its program to 66 groups it submitted a supplemental request of $219,749,000, making a total operational budget of $909,486,000. Vinson says this, even with Army allocations for USAF support, still is $100,000,000 less than USAF insists it needs for operating a 66-Group force.

The revised figure would provide for 416,000 man years, compared with the current strength of 374,000 and the 420,000 required for a 70-Group program.

Vinson's break-down on some Budget Bureau cuts of USAF estimates for implementing a 66-Group program:

- **Spare Parts and Aircraft Modifications.** USAF asked for and obtained $90,000,000 under the 55-Group program. But USAF's request for $68,000,000 supplemental for a 66-Group program was trimmed by Budget Bureau to $50,000,000. So USAF is offered a total of $140,000,000 for the coming year—$18,000,000 less than it asked.
- **Civilian Personnel.** USAF asked for and obtained $313,000,000 in the budget for a 55-Group program. The service's request for $60,000,000 additional for 66 groups was cut to $45,000,000 by Budget Bureau. Approved allocation of $358,000,000 is $15,000,000 short.
- **Air National Guard (Indirect support from the Army).** USAF asked for and obtained $56,000,000 for 55 groups. Its supplemental request of $44,000,000 for 66 groups was slashed to $15,000,000 by Budget Bureau. USAF would get $71,000,000—$29,000,000 less than it requires.
- **Organized Air Reserve (Indirect support from the Army).** USAF originally asked for and obtained, under the 55-Group program, $52,000,000. Its request for $32,500,000 additional for a 66-Group program was cut back by Budget Bureau to $21,000,000. This gives the service a total of $73,000,000, or $11,500,000 less than it needs.

REP. CARL VINSON says Budget Bureau is cutting USAF below 66 groups.

Airport Lighting—What's Ahead?

Lighting an airport used to be a simple matter, but it isn't any more. Commercial operations require greater reliability. Bigger, faster planes require greater approach and landing areas. And lighting technology has made such advances that engineers now know what was wrong with older methods.

What has gone before and what is likely to come are told in a special AVIATION WEEK report to the industry on airport lighting—page 18 of this issue.

Jet Engine Approved For Transport Use

Allison 400-C4 turbojet engine has received the first Approved Type Certificate from the CAA authorizing jet engine installation in commercial transport aircraft. At least three jet transports utilizing the new engine are nearing the construction stage.

The engine is rated at 4000 lb. static thrust without the use of water injection. Water injection increases this output to 4600 lb. for short periods. The commercial engine weighs about 1800 lb. That these ratings have already been surpassed in new military versions is apparent from Air Force stipulation that Allison can offer jet engines commercially only at such time that an improved version is in production simultaneously for military use.

Issuance of ATC No. 254 is indicative of the fact that the engine passed the standard CAA type certification tests prescribed for conventional reciprocating types including duration between overhauls. Allison is prepared to produce the commercial engine in quantity since its present facilities are more than adequate to meet commercial needs in addition to an expanded military procurement program.

NACA Committee To Investigate Fire

A scientific study of the problem of aircraft fire has been launched by National Advisory Committee for Aeronautics. Under the personal direction of Lewis A. Rodert, 1946 Collier Trophy winner, the program is designed to increase basic knowledge in the field of combustion and its relation to aircraft fire safety.

Assisting Rodert in the administration of the project is a special 16-man subcommittee including representatives of military, government and private industries most directly concerned.

First phase of the study, according to Rodert, is a thorough review of current information and an analysis of present programs both here and abroad to determine gaps in existing knowledge. Rodert plans a trip abroad to survey the field in England, France, Switzerland and Sweden. He feels that present activities in the field consist largely of opinions and prejudice that only a comprehensive scientific research program can resolve. He believes there are two approaches to the problem:

▶ **Reduction of Hazards**—New research is needed on the sources of fire including the ignition, exhaust, fuel, lubricating and other aircraft systems.

▶ **Flammability**—A study is required of the physical and chemical phenomena of fire, an improvement of basic knowledge of extinguishing agents and their action, and the flammability of aircraft fluids and materials.

Rodert has set no time limit on the completion of the entire program. The immediate, two-year goal is to solve the most pressing problems (fire sources, inflammable fluids). The basic combustion and extinguishing research program will extend well into the future.

First organizational meeting of the subcommittee was held at NACA Flight Propulsion Research Laboratory, Cleveland, March 18 and other meetings will be held as required. Although the program will be centered at Cleveland, Rodert plans to utilize all available facilities at Wright Field, CAA at Indianapolis, Cornell at Ithaca, N. Y., and private laboratories throughout the nation.

▶ **Members**—NACA subcommittee on Aircraft Fire Prevention:

Lewis A. Rodert, NACA, chairman; Arnold Dircksen, equipment laboratory, Air Materiel Command; Charles W. Shubart, Navy Bureau of Aeronautics; Harvey L. Hansberry, CAA Experimental Station, Indianapolis; John M. Chamberlain, CAB Safety Bureau; J. A. Dickinson, National Bureau of Standards; E. M. Barber, supervisor, Engineering Research, The Texas Co.; John G. Borger, chief project engineer, Pan American Airways; David L. Posner, Civil Aeronautics Administration; Allen W. Dallas, Air Transport Association; Harold E. Hoben, engineering dept., American Airlines; C. R. Johnson, Shell Oil Co.; Raymond D. Kelly, engineering development, United Air Lines; Gaylord W. Newton, power plant unit, Boeing Aircraft Co.; Ivar L. Shogran, Douglas Aircraft Co.; Lon Storey, Jr., Lockheed Aircraft Corp.; and C. G. Trimbach, development engineering, Cornell Research Foundation.

Taylor and Cook Form Washington Company

Irving H. Taylor and Charles M. Cook, former Washington representatives for Douglas and Consolidated-Vultee, respectively, have announced establishment of Industry Services, Inc., to represent aviation companies and allied interests in Washington. The corporation, with offices at 810 Dupont Circle Bldg., will help clients with exporting, document and technical problems as well as act as a liaison with federal agencies and foreign purchasing missions in regard to sales.

Taylor is a director of the Babb Co., Inc., was formerly assistant to the president and eastern representative of Douglas Aircraft Co., general manager of the Aeronautical Chamber of Commerce (now AIA), chief of the automotive-aeronautic trade division Bureau of Foreign and Domestic Commerce, and commercial attache in Europe. Cook served previously as Washington representative for Convair, chief of aircraft section, Office of International Trade, and export manager of the Aeronautical Chamber of Commerce.

ICAO Delegation

President Truman has approved a 23-man delegation to represent the U. S. at the International Civil Aviation Organization's second annual assembly at Geneva, Switzerland, June 1.

Russell B. Adams, Civil Aeronautics Board member, will head the U. S. delegation. John Alison, assistant Secretary of Commerce for Air, and Paul Aiken, second assistant Postmaster General, will be consultants. Hall L. Hibbard, vice president of Lockheed Aircraft Corp., and Stuart G. Tipton, general counsel of the Air Transport Association will attend as industry advisors.

New Speed Record

Jacqueline Cochran (Odlum) raced her stripped-down North American P-51 Mustang fighter over a 2000-kilometer course at an average speed of 448 mph. to establish a new world's record for the distance. The old mark of 440 mph. was set by Lieut. J. J. Hancock, USAF, in a Lockheed P-80 Shooting Star jet fighter. Cochran's 2 hr., 46 min., 38 sec. roundtrip between Palm Springs, Calif. and Santa Fe, N. Mex. was officially timed by a representative of the National Aeronautics Association.

B-36A PRODUCTION FEATURES REVEALED

Major design changes in production model Convair B-36A are revealed in close-ups here. Quadricycle landing gear, right, distributes ground load to permit operation on wide variety of airfields. Each double-wheel truck is linked to walking beam on main strut to equalize load on front and rear trucks. Front link is shock strut taking initial landing loads. Tiny upper strut sustains no load but damps oscillations of gear. New bubble canopy and nose enclosure, left, sustains pressurization, thus requiring extensive framework rather than single-blown design. Transparent panels are laminated glass and plastic and compound curves required separate molds.

Conflict Perils Plane Development

All favor the "objective" of legislation for federal financing of transport types, but differ on method.

Plans for the government to finance development of commercial transport and cargo planes may be lost in a maze of controversy over who will do the job and how.

This was plain last week as committees tackled the bills introduced by Owen Brewster (R., Me.) in the Senate and Carl Hinshaw (R., Calif.) in the House. The identical measures would:

- Lodge direction of a program to develop types suitable for both commercial and military use with the Secretary for Air.
- Authorize him to spend Air Force funds on the project.
- Authorize him to appoint a five-member advisory Civil Air Transport Evaluation and Development Board consisting of representative of USAF, Navy, CAA, CAB and NACA.
- Provide for a six-member industry advisory committee to function under the Board.

The controversy centers around those features.

▶ **Argument on Methods** – Witnesses representing CAB, CAA, and the Air Force, the air transport and aircraft manufacturing industries last week appeared before hearings of the Senate Interstate and Foreign Commerce Committee and the House Armed Services Committee. They lined up unanimously behind the "objectives" of the Brewster-Hinshaw bills, but differed widely on the method for its accomplishment.

CAB Chairman Joseph O'Connell steered a middle course between CAA, calling for all-out civilian control of the program, with the Air Force, Air Transport Association and some aircraft manufacturers endorsing the bill's plan for military control.

▶ **Seek Civil Control**–Although O'Connell's plan was presented as a compromise on the civilian versus military control issue, it would decisively shift the weight of authority to civilian side. It offers the brightest hope for agreement among administration, Congressional, and industry representatives–and unless that is accomplished, legislation appears to have little chance of enactment at this session.

"While CAB still favors the development of transports through an independent corporation (composed of the same membership as the proposed Civil Air Transport Evaluation and Development Board)", O'Connell testified, "We believe that the program is of sufficient importance so that we would not oppose its adoption within the general organizational framework of" the Brewster-Hinshaw bill.

▶ **Board Changes**–The amendments he proposed, enhancing the role of the Civil Air Transport Evaluation and Development Board (composed of three civilian and only two military members) and diminishing the role of the Secretary for Air, would however, result in conclusive civilian control of the program: That the board, instead of the Secretary for Air, be given responsibility for making a national survey of transport and cargo plane requirements; that chairmanship of the board be limited to its civil representatives, that it be permitted to determine its own procedures and regulations, that its actions be by a two-thirds vote (permitting civilian to over-ride military representatives), that the board–rather than the Secretary–name the industry advisory panel; that the board be given the initiative to determine the characteristics and specifications for prototypes and the role of the Secretary be restricted to approval or rejection; that Air Force funds for commercial plane development be specifically earmarked, assuring their expenditure for that purpose.

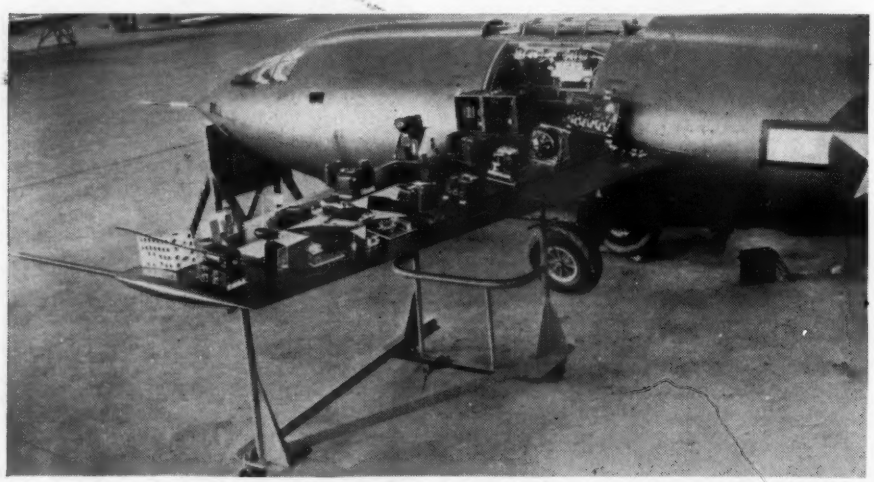
▶ **Opposition**–The administration is expected to oppose the bill in its present form and recommend revisions along the lines suggested by O'Connell. The Air Force, which originally supported enactment of the measure made a last-minute switch in its position, after being notified of Budget Bureau opposition to its provisions. In his testimony C. V. Whitney, assistant Secretary for Air modified USAF's position to "in support of the intent" of the measure.

▶ **Lee's Testimony**–Frederick B. Lee, acting CAA administrator urged that the Department of Commerce be authorized to undertake the development program. Both Lee and O'Connell emphasized the need for development of small types for feeder service. In a large measure, O'Connell said, the financial difficulties of the feeder lines are due to the fact that small planes are not available and they are forced to operate 21-passenger DC-3s with small loads. Lee added that numerous towns designated for feeder service find it impossible to finance airports large enough to accommodate DC-3s, and development of a smaller craft would lighten the financial burdens of airport operators as well as feeder lines.

ATA's executive vice president, Robert Ramspeck endorsed the Brewster-Hinshaw proposal.

▶ **Navy Wants Seaplanes**–John Nicholas Brown, Assistant Secretary of Navy for Air, asked that the Secretary for National Defense's ruling that seaplane development be lodged with the Navy be written into the measure as an integral part.

Four aircraft manufacturing representatives enthusiastically supported the Brewster-Hinshaw measure, reporting that neither manufacturers nor airlines are able to withstand the mounting developmental costs on new planes. They were Burdette S. Wright, vice president, Curtiss Wright; Albert Lombard, military sales manager, Consolidated Vultee; Arthur Raymond, vice president, Douglas Aircraft; and Robert Gross, president, Lockheed Aircraft.



XS-1 INSTRUMENTATION REVEALED

Maze of complex flight research instruments carried in the supersonic Bell XS-1 research plane are shown here displayed adjacent to special compartment in which they are installed. Instruments permit indicating, recording and transmitting flight test data on control forces, structural loads, airflow pressure distribution, airplane flight attitude, power plant and aircraft performance. These instruments were especially designed and developed by the National Advisory Committee for Aeronautics.

► **Manufacturers Testimony** – Lombard asked that the bill's prohibition against the use of developmental funds for "commercial equipment" – passenger seats, etc.–be stricken out, since "CAA requires the manufacturer to submit an airplane in its completed state for airworthiness tests and seats and other interior furnishings must undergo tests showing structural integrity." Raymond endorsed the amendments proposed by O'Connell which would switch control from the Secretary for Air to the civilian-dominated Civil Air Transport Evaluation and Development Board. Gross, on the other hand, declared that "the bill is right because it gives the Air Force, which will be the principal user of the product in the event of a national emergency, the responsibility for its development. . . ."

Independents Fight Economic Regulation

Independent air operators have presented their case against regulation of contract operations by CAB.

Their chief spokesman, Raymond Norden, president of Seaboard and Western Airlines, proposed a "reasonable requirement" for safety regulation and registration of contract carriers. But, he told the aviation subcommittee of Senate Interstate and Foreign Commerce Committee, the independents oppose legislation bringing all contract operations (except infrequent flights of planes with five or less passengers) under economic as well as safety regulation.

The subcommittee is holding hearings on this bill which is sponsored by the Congressional Aviation Policy Board, five members of which sit on the subcommittee.

► **Independent Spokesmen**–Other spokesmen for the independents: Col. Roscoe Turner, president, Turner Aviation Corp.; Harry Meixell, executive director, Aviation Trades Association; Harold Montee, Seaboard and Western. H. B. McCoy, director of the Bureau of Foreign and Domestic Commerce, and Edward Dumbauld, special assistant to the Attorney General, gave Commerce and Justice Department backing to the independents' position. McCoy maintained that registration and reporting by contract carriers would solve the main complaint of scheduled airlines, namely, that common carrier services are being engaged in under the guise of contract service to escape regulation by the governing agencies.

Robert Ramspeck, representing Air Transport Association and Emory Nunneley, representing CAB, endorsed safety and economic contract regulation. They previously testified before the House Interstate and Foreign Commerce Committee, which concluded hearings on the subject without testimony being presented by representatives of the independents.

► **CAB Authority Opposed**–Norden hit at provisions giving CAB authority over international contract rates, prohibiting dual–common and contract–operations in the same area, and directing the suspension of contract licenses for infrequent service.

Pointing out that CAB lacks authority to regulate international scheduled rates, Norden said that CAB control over contract rates would "enable certificated carriers to juggle rates . . . so as to take business away from the contract carriers whose rates could not be fluctuated without the permission of the board." He declared that it is "absolutely essential" that contract carriers be permitted to retain flexibility and offer contract and common services in the same general area. This provision, plus the "requirement that each contract carrier license specify the points and areas to be served, the nature of traffic and commodities to be transported, and other limits on operations–such as minimum number of flights for which contracts may be made–would defeat the essential requirement of flexibility inherent in contract business," he told senators. Operational flexibility would be further handicapped, he suggested, by a provision that CAB suspend licenses when services are not performed over routes and at the frequency authorized by the licenses.

Channel Wing Test

Encouraged by success of a vertical lift test of a single Channel Wing, Willard R. Custer, Hagerstown inventor, is preparing for flight tests of his No. 2 Channel Wing Airplane. Custer's National Aircraft Corp. has the fuselage completed with one channel wing attached, and within a few weeks, as soon as the other channel wing is attached and the plane is painted, ground tests are scheduled to start at Hagerstown Municipal Airport. In the recent vertical lift test, one channel wing, using a 75 hp. Lycoming engine and a fixed pitch propeller lifted itself and two men weighing approximately 300 lb. to an altitude of 5 ft. in a test rig, and then lowered them gently to the ground. The test was made in presence of numerous Hagerstown residents. (Principle of the Custer Channel Wing was described in AVIATION WEEK, Sept. 15, 1947)

Aircraft Committee For Munitions Board

A permanent aircraft committee of the Munitions Board has been organized with Rear Admiral A. M. Pride, chief of the Navy's Bureau of Aeronautics, as chairman.

The Board was set up as a result of a study by Maj. Gen. Oliver P. Echols, wartime chief of Air Force procurement at Wright Field and now president of the Aircraft Industries Association. Echols served as special consultant to Defense Secretary Forrestal (AVIATION WEEK, Apr. 1) for the job and has now resumed his duties as AIA head.

► **USAF Members**–USAF is represented on the Board by Maj. Gen. E. M. Powers, Maj. Gen. F. H. Smith and Brig. Gen. A. A. Kessler. The Army member is Brig. Gen. J. K. Christmas. In addition to Pride, the Navy contingent consists of Rear Adm. E. W. Litch and Captain Lloyd Harrison.

Primary function of the new committee are:

- Coordinate current aircraft procurement programs of all three services and develop industrial mobilization plans for the aircraft industry.
- Recommend standardization of materials, processes equipment and design requirements and test procedures.
- Allocate materials in accordance with priorities established by the Joint Chiefs of Staff.
- Determine supply and maintenance requirements for spare units and parts for military aircraft.
- Standardize military aircraft used by more than one service.
- Evaluate impact on the aircraft industry of current and future procurement indicating areas where there will be shortages of labor, materials and production capacity.
- Recommend legislation necessary to implement industrial mobilization of the aircraft industry.
- Recommend any dispersal action deemed necessary for the aircraft industry.
- Recommend allocation of manufacturers' plants between the USAF and Navy for peacetime procurement and planned emergency expansion.

New Use for Copter

A new government use of the helicopter surveying inaccessible lands–has been inaugurated by the Interior Department through contracts with private helicopter operators. Following a successful operation in Colorado this spring, Interior is now planning a more extensive survey to take place in Alaska this summer.

INDUSTRY OBSERVER

► Republic started deliveries on its new P-84C Thunderjet fighter in April, and the model is now current type in production. Originally designed to use the new General Electric J-47A (TG-190) engine, production delays in engine deliveries have resulted in the new models going into service with the standard Allison-GE J-35 (TG-180) engine installed. The P-84C is being supplied to the 33rd Fighter Group, Walker Air Force Base, Roswell, N. M.

► **Navy's .60-caliber machine gun is now in quantity production and is being installed on the new Grumman F8F-2 Bearcat fighter and the McDonnell F2H-1 Banshee jet fighter. The gun has a slightly lower rate of fire than the standard .50, but its heavier slug enables it to deliver a greater weight of fire. A movable type, suitable for power-driven turrets, is now under development test.**

► Fifth Northrop B-35 flying wing bomber has been flight delivered from the Hawthorne, Calif., plant to Muroc Air Force Base, Calif. The flight was made by Fred Bretcher, pilot; Charles Tucker, copilot; and Orva Douglas, flight engineer. Tucker, former National Air Race pilot, is a new addition to the Northrop test pilot staff and was being "checked out" in the huge wing.

► **Air Force has disclosed two new helicopter projects, the Piasecki XR-16 and Kellett XR-17, both considerably larger than anything yet contemplated. The Piasecki design follows the familiar Navy HRP-1 dual-rotor layout, but it is about twice as large. It will be able to carry 25 fully equipped troops or 5000 lb. of cargo. The Kellett design will utilize the General Electric-developed jet rotor system (Aviation Week, May 3) on a 130-ft. blade. This "flying crane" design will be used to lift loads up to 24,700 lb. and carry them 65 miles, sufficient to get a tank across a wide river or a stretch of difficult jungle.**

► Air Transport Association probably won't fight CAB's order requiring a third flight crew member on the Boeing Stratocruiser. But the airline group will continue to contend that a flight engineer is not needed on DC-6s on the basis of the plane's operating record to date and because CAA has approved the DC-6 as a two-man airplane after proving runs.

► **Airlines figure they lost between $500,000 and $1,000,000 as a direct result of CAB's order forcing utilization of terrain proximity indicators on all aircraft used in scheduled service and carrying passengers at night or under instrument flight rule conditions. The Board recently rescinded the rule, which was to have become effective May 15, admitting that its order was premature in view of evidence that the instruments have not yet been sufficiently perfected (Aviation Week, May 10).**

► British Overseas Airways Corp. negotiations with Canadair, Ltd., Montreal, for the purchase of $35,000,000 worth of DC-4M transports look promising. Canadair is completing delivery of 20 of the craft to Trans-Canada Air Lines for both domestic and trans-Atlantic service. BOAC's trans-Atlantic route parallels TCA's Gander-Shannon-Glasgow-London route.

► **British Ministry of Civil Aviation has returned the Tudor IV to passenger service but will not allow its use on the Azores-Bermuda run where a BSAA Tudor IV was lost without trace. British are still running range and fuel consumption tests on the plane. The Azores-Bermuda run has long been known for its highly variable headwinds and unpredictable storms.**

► Air Force will put the Boeing XB-47 through its Phase II test program at Muroc this month. Second XB-47 has been completed and will be turned over to the Air Force this month. Boeing will eventually get both planes for a third phase test program including maximum speed and altitude tests.

► **Prototype of the Italian Breda-Zappata BA 308 multi-engine transport is nearing completion. Three have been ordered by the Argentine air force and four by Alitalia, a British-controlled Italian airline.**

► Prototype McDonnell XP-85 was damaged when a crane lifting it into place in the NACA Ames Laboratory 40-ft.-by-80-ft. wind tunnel failed and dropped the tiny craft. The parasite fighter was returned to the St. Louis plant, reworked and is now back at Ames undergoing wind tunnel tests.

► **Curtiss XP-87 has completed 15 flights at Air Force base Muroc, Calif., and is now undergoing several weeks of ground modifications including connection of the cockpit pressurization and cooling system, tail modifications and structural rework of fuel tank supports.**

New Race Group

Southern California International Air Races, Inc. has been formed under the sponsorship of the Southern California chapter of the National Aeronautics Association to stage an annual aviation racing meet. The first meet will be held early next year at the Long Beach (Calif.) Municipal Airport.

Active in the new group are Larry Therkelson, NAA official timer; Glenn Odekirk, manager of Hughes Aircraft Co. and Marvin Whitman, owner of Whitman Airpark. The non-profit organization will also sponsor an annual aviation exposition and local model airplane contests.

AVIATION CALENDAR

June 1—ICAO second assembly, Palais Des National, Geneva, Switzerland.
June 1-6—Second annual all woman air show, Miami.
June 5-6—Shawnee Air Fair & Pottawatomie County Industrial Exposition, Shawnee, Okla.
June 5-13—International lightplane tour of Italy, open to U. S. aircraft through National Aeronautic Association.
June 6-11—SAE Summer Meeting, French Lick Springs Hotel, French Lick, Ind.
June 7—Fifth annual personal aircraft meeting, Institute of the Aeronautical Sciences, Rackman Memorial, Detroit.
June 8-10—Airport Management Conference, College Station, Tex.
June 9—Fifth annual personal aircraft meeting, Institute of the Aeronautical Sciences, Hotel Allis, Wichita.
June 10—Fifth annual personal aircraft meeting, Institute of the Aeronautical Sciences, Engineers Club, Dayton.
June 11-13—Spring Air Cruise sponsored by Pennsylvania Aviation Trades Association, Williamsport, Pa.
June 14-15—Airlines Medical Directors Association, annual meeting, Royal York Hotel, Toronto.
June 16-18—19th annual meeting, Aero Medical Association, Royal York Hotel, Toronto.
June 16-18—Tenth annual Western Safety Conference, Hollywood-Roosevelt Hotel, Los Angeles, Calif.
June 17-18—Aviation Distributors and Manufacturers Association, Grand Hotel, Mackinac Island, Mich.
June 21-25—American Standards Association seminar by Dr. John Gaillard, Engineering Societies Building, New York.
June 21-25—1948 annual meeting, American Society for Testing Materials, Detroit.
June 22-23—Annual Ohio State Aviation Clinic, Bowling Green.
June 27-30—Annual convention, National Aeronautic Association, Hotel Radison, Minneapolis, Minn.
June 30-July 1—National Soaring Contest, Elmira, N. Y.
July 2-9—Second National Air Tour Week, United Pilots and Mechanics Association.
July 4-5—Annual National Air Show, Port Columbus, Columbus, Ohio.
July 13—ICAO North Pacific regional meeting, Honolulu or Vancouver.
July 14-15—Institute of Aeronautical Sciences' annual summer meeting and dinner, Hotel Ambassador, Los Angeles.
July 16-24—Airport construction equipment display, American Road Builders Association, Soldiers Field, Chicago.
July 17-18—National Trading Day and All-Dixie Air Show, Chattanooga, Tenn.
July 19-31—International Sailplane contest, Samaden, Switzerland, open to U. S. contestants through National Aeronautic Association.

ENGINEERING & PRODUCTION

Boeing Strike

Cut in Seattle retail sales due to payroll losses may be force for settlement.

The union showed signs of softening, the company stood firm and the city worried as the strike at Boeing-Seattle entered its second month.

Of the three factors, the attitude of the community might be the most telling. Last week, with $3,720,000 already lost in payrolls, many small retail stores were feeling the pinch. Some, with volume cut as much as 25 percent, laid off employes.

▶ **"Call A Halt"**—In a page one editorial, the Seattle Post-Intelligencer declared, "It's time to call a halt" to the strike "before our number one industry is jeopardized . . . Both the company and the union have an obligation—to themselves, to the community and to the nation—to settle the dispute."

As if in answer, Joseph McBreen, a vice president of International Association of Machinists (parent body of Aeronautical Mechanics Union) offered to "submit to changes in our negotiating committee if Boeing will also submit to changes in its negotiators."

Boeing's President William M. Allen replied, "We feel the union officers should immediately call off this unauthorized and unlawful strike. Our objective then would be to negotiate a fair and workable contract. . . . If the strike were called off we would deal with the duly-constituted representatives of the employes, whoever they may be."

McBreen declared IAM would call off the strike only "when an agreement is reached that is satisfactory to the 14,800 Boeing employes we represent." He said the union was willing to do everything possible, short of calling off the strike, to get the company back into collective bargaining. He said the seniority issue continues to be the main point blocking settlement between the company and the union.

▶ **Wage Increase**—Boeing continued to advertise for workers willing to cross the picket lines and made it more tempting by granting a 15 cents an hour wage increase to all hourly employes. Allen claims the increase makes Boeing personnel the best paid aircraft workers in the world. At present the boost affects about 1000 workers, but would apply to all union members should they all decide to return to their respective jobs.

The union demands a 30-cent increase, 10 paid holidays and retention of the existing strong seniority clause. To this Allen says the 15 cents is the "maximum we can pay and still be competitive" and the company must have a "modified seniority system to build an efficient working organization."

Convair Changes

Harry Woodhead has been elected vice chairman of the board of Consolidated Vultee Aircraft Corp. He resigned as president to take the new position. Floyd B. Odlum, chairman of the board, becomes president for an interim period, with indications that the post eventually will be taken by La Motte Cohu, who resigned recently as president of TWA.

L. W. Miller succeeds V. C. Schorlemmer as vice president in charge of finance. Schorlemmer resigned because of ill health. Miller formerly was vice president and treasurer and member of the board of Northeast Airlines.

A net loss of $2,765,918 for the first quarter of the 1948 fiscal year, ended Feb. 29, was reported by the corporation.

$2,500,000 Overhaul Contract for TEMCO

Air Force contracts for overhaul have been long anticipated by independent maintenance organizations. The first of these to be made public is a $2,500,000 contract for C-54 overhaul awarded to Texas Engineering and Manufacturing Co. Other bidders were Douglas Aircraft Co., Lockheed Aircraft Corp., Grand Central Aircraft Service and Aviation Maintenance Corp.

▶ **45 Transports**—The military contract covers complete overhaul of 45 transports, and will probably extend into March, 1949.

Notification of the contract award by the Air Materiel Command at Wright Field brought an announcement from TEMCO that it would immediately hire 500 employes in order to speed work on the program which begins next month. The company now employs 1500.

▶ **Complete Overhaul**—AAF will start delivery of the C-54s to the Dallas company on June 1. Return deliveries of the overhauled ships will begin in August. Overhaul includes the sealing of integral fuel tanks, engine changes and complete final assembly operations concluding with flight testing of the planes by TEMCO.

The company is currently modifying Martin 2-0-2s for Northwest Airlines and is continuing an aircraft overhaul program contracted with the Brazilian government.

Personal Plane Exports

Twelve personal aircraft companies exported 74 aircraft valued at $363,432 for the month of April, it is announced by Aircraft Industries Association.

The totals represent 10 percent of production and 13.3 percent of dollar values for these companies, as compared with 47 planes, or 7.1 percent of all production, valued at $227,451 for the previous month, when dollar value was 9.7 percent of total output.

Greatest importer was Brazil which received 21 aircraft valued at $102,039. Canada was second, receiving 19 aircraft valued at $57,560.

Other importers: South Africa, seven; Mexico, five; Argentina, French Indo-China, four; Chile, Cuba, three; Switzerland, Uruguay, two; Colombia, Haiti, India, Netherlands West Indies, one each respectively.

Wright Averts Strike

Wright Aeronautical Corp.'s threatened walkout of 1400 white-collar workers was averted last week when union and company officials signed a contract granting employes a 10-cent-per-hr. increase, retroactive to Mar. 8 and terminating Sept. 8, 1949.

Settlement gives a gain of $600,000 to the workers, members of the Engineer and Salaried Employes Association, Local 300, UAW-CIO. Starting wages range from $42 for mail clerks to $115.20 for design and layout men. Average pay is estimated at $1.73 per hr.

Lockheed, IAM Negotiate

Wage increase agreements, including a proposal which provides a five cent increase for hourly employes, have been reached between negotiating committees for the Lockheed Aircraft Corp., and Lodge 727, International Association of Machinists.

The agreements will be voted on by IAM membership on or before June 1. If approved, they will be retroactive to May 10.

APPROACH TO ARCATA Landing Aids Experimental Station probably has more lights than any other in the world. The forest of poles under the DC-3 marks five different types of lights or systems. Most easily seen are the AGA funnel system (extreme left and right) and CAA's slope-line system, appearing as dark diagonal slashes inside the AGA lights.

What's Ahead for Airport Lighting

Efforts to improve visual aids to bad-weather landings have produced several different systems and plenty of controversy.

By William Kroger

Lighting an airport used to be simple—a few boundary markers and floodlights to illuminate the landing area. It isn't any more (except for small fields). Proper lighting of airport runways and their approaches now comes close to being a science—as yet generally unrecognized.

Since the early days of flying, pilots have gone astray looking for airports on smoggy days and murky nights; yet as recently as the first war years the Air Force insisted approach lights were unnecessary. Still more recently—little more than a year ago—airline pilots created a furor in the Senate safety investigation by injecting into the instrument landing system controversy urgent pleas for more and better lights.

Even today, with civilian airport construction reaching a new peak, the nation's largest supplier of airport lighting equipment reports that few airport engineers and designers bother to get advance information on runway and approach lighting for their planning.

▶ **Industry-wide Problem**—For best approach scheme, lighting engineers say they need an assist from three other sources—aircraft designers, airport engineers and city planners.

• The aircraft designer's role is cockpit re-arrangement in transports so the pilot looks down at a sharper angle and can see more lights.

• Job of the airport engineers is more immediate. Lighting experts have two major faults with today's airport layouts: One, runways are getting too wide (they consider 200 ft. a good width, 300 ft. too much. Under very bad conditions a pilot following a line of lights extending from one edge of a runway cannot see lights on the other side of a wide runway. Two, the beginning of nearly every runway is intersected by a taxiway; the gap between the first runway lights and the threshold lights is just wide enough to be confusing when visibility is very poor.

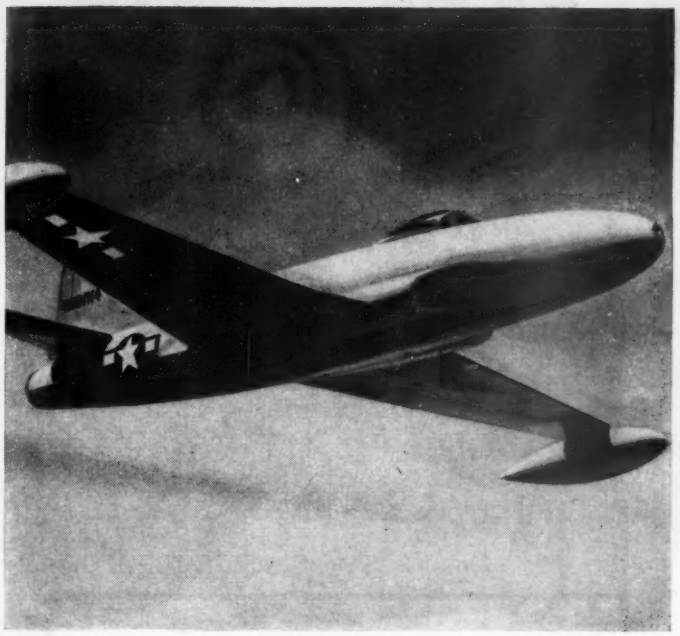
• Concern of city planners is to have the airport zoned so there will be no difficulty in running approach lights out several thousand feet.

These factors highlight some of the intricacies of a slowly developing philosophy on approach lighting, complicated by a lack of full understanding of its nature, and its involvement in governmental policy and planning.

Runway lighting, in contrast, is more static. The technology is better known; argument arises more from a basis of competitive merchandising than from any unsettled dispute over the method of lighting.

▶ **Runway Lights**—Practically all runway lights being installed now—and those installed in the past few years—are spaced 200 feet apart on each side of the runway and are raised 20 to 36 inches off the ground. They all cast a whitish light and have five degrees of brightness: 100, 50, 30, 10, and 1 percent. Their intensity varies, although all are high intensity (30,000 cp. or greater at peak), and the coverage of the beams differ.

Principal manufacturers of runway



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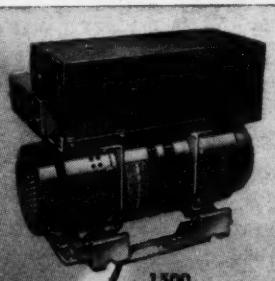

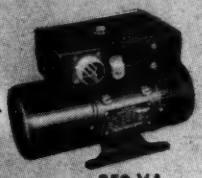

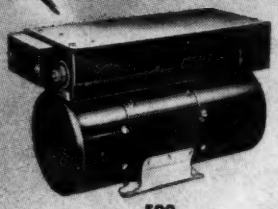

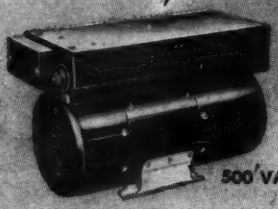

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32E00	27.5 V	115 V, single phase, 500 VA 115 V, three phase, 750 VA
1518	27.5 V	115 V, single phase, 1500 VA 115 V, three phase, 2000 VA

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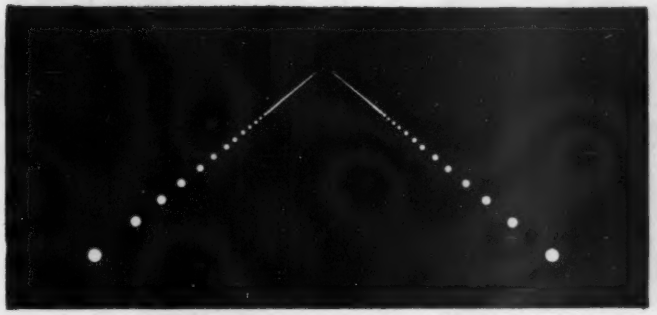
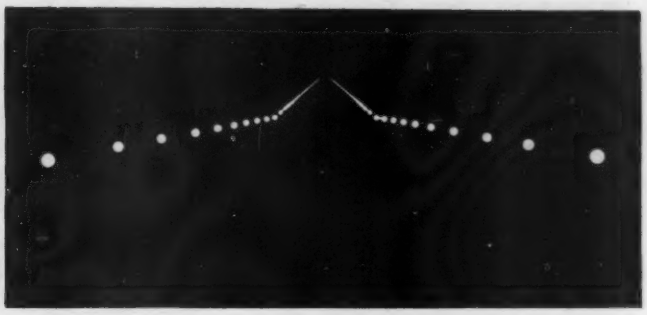




PERSPECTIVE—With plane on proper glide path, left shows perspective when lights are level and parallel and all "vanish" toward same point. Approach lights on right could be either funneled toward runway or mounted downward over an obstacle.

lights are: Crouse-Hinds, Westinghouse, Revere Electric, American Gas Accumulator (marketed by General Electric) and Line Material Co. Line Material manufactures and sells lights developed by J. B. Bartow, the pioneer airport lighting specialist. Bartow developed, and L-M sold the principle of elevated runway lights (although the Air Force at first insisted 26-in.-high lights were a menace). L-M produced about 40,000 such lights during the war and last year installed all but one of the runway lighting systems put on commercial fields.

▶ **Bartow's Control**—Bartow also developed, but too late for wartime use, the controllable-beam light. This is the backbone of his lighting philosophy for both runway and approach. It is the controllable-beam feature that sets the Bartow light apart and gives L-M its principal selling point—and its competitors their main point of attack. For L-M claims better results with less candlepower than used by some of its competitors.

Other lights are fixed-focus and permanently coned-in several degrees toward the runway centerline. The intensity is controlled to meet varying atmospheric conditions. The Bartow light has intensity control, and also a synchronized adjustment of the beam of each light from a master panel in the tower. Purpose is to combat glare and halo.

▶ **Glare and Halo**—Ordinarily, the higher the intensity of any light, the greater the possibility of glare. And when there are several lights in a row, each of equal intensity, the brightness of the nearest one tends to diminish the effectiveness of the lights farther away. Halo effect occurs when there are rain, snow, fog or dust particles in the atmosphere, so that a beam of light which ordinarily would not be intercepted by the eye is reflected and refracted. Instead of a clear-cut sharp beam, the light source then appears as a great fuzzy blob. It obscures any lights behind it.

The AGA, Westinghouse, Revere, and Crouse-Hinds lights all cast wide swaths across the runway. One argument for this is that aircraft do not always approach along the centerline of the runway or in the ideal glide path. The Air Force has endorsed the wide beam type of light. Disadvantage of the wide beam is that it makes glare and halo more probable. USAF says that because of the advantage of the wide beam, any glare is "tolerable," or a "necessary evil."

L-M's view is that glare is never tolerable when it can be eliminated, and it is convinced that Bartow's controllable-beam light does just that. Although the Bartow light peaks at 180,000 cp. (higher than most of its competitors), the lens of each light is so formed that it casts a narrow beam angled to reach a certain point on the centerline of the runway at a given intensity. Result is that the pilot sees every light at the same intensity all down the runway.

The Bartow lens, made by Corning Glass, utilizes the principle that light travels faster through air than through glass. Mathematically-calculated prisms slow down and "bend" part of the light to concentrate it into the narrow beam. The intensity is the same in both directions along the runway, and the prisms permit lesser intensity light to pass through to the runway and off-runway sides, giving the light 360 deg. coverage.

▶ **Allard's Law**—Penetration of light through bad atmospheric conditions is solely a matter of intensity. This is based on two principles of physics, the inverse-square law and its complementary formula, Allard's law.

The inverse-square law is merely that in a vacuum one candlepower will illuminate a surface one foot away to the extent of one foot-candle, but will illuminate a surface three feet away with only one-ninth foot-candle (candlepower of the source divided by square of the distance).

Allard's law takes into consideration that the atmosphere, not being a vacuum, contains particles that cut down light penetration. This fact is coupled with the inverse-square law to give a formula for determining how much light is left after penetrating atmosphere of various conditions.

▶ **Light Transmission**—As a simple example, assume a light of 100,000 cp. is to penetrate a moderate fog that has a transmission factor of 10 for each 100 ft. (will permit 10 percent of the residual light through each 100 ft. of fog). The light is to be visible 300 ft. away. According to the inverse-square law, the light would appear as only 1.11 foot-candle 300 ft. away even if no fog were present. With the fog, the light loses an additional 90 percent of its intensity for each 100 ft. it travels. Result: a source of 100,000 cp. will appear 300 ft. away through moderate fog as only .0111 cp.

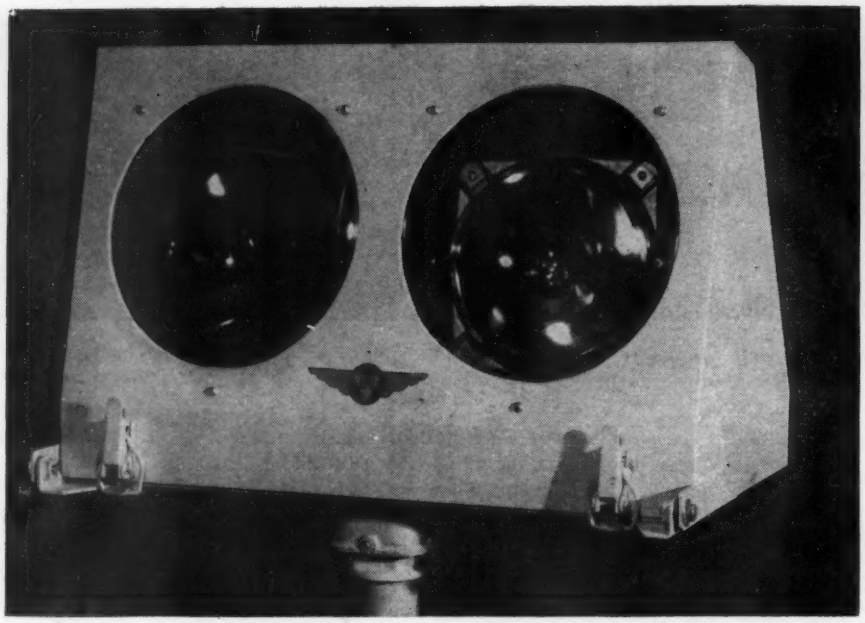
By using Allard's law and setting transmission factor values for various atmospheric conditions, lighting engineers can calculate the source candlepower required to penetrate a given number of feet (see chart, page 22).

The application of the inverse-square law and Allard's formula in runway lighting is that as visibility decreases, the maximum penetration of the light will decrease until the beam no longer reaches the centerline of the runway. Commonest method of meeting this difficulty is to increase the candlepower at the source for greater penetration.

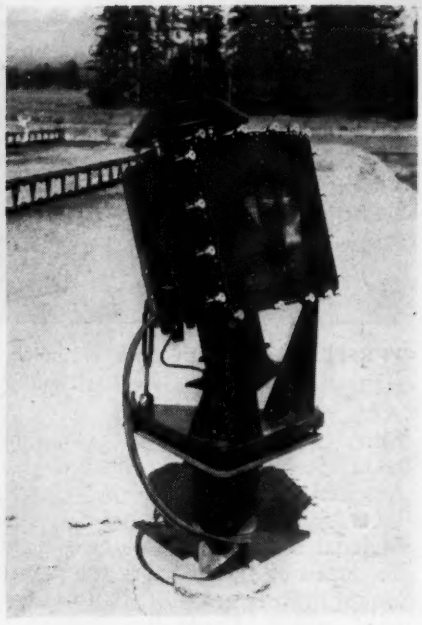
The lamp for the Bartow light, however, travels along a small track inside the double lens. This is the controllable feature, permitting the tower operator to "toe-in" the light as visibility lessens. In effect, rather than trying to get deeper penetration, this toeing-in process cuts down the distance between the light and the centerline, that is, cuts down the distance that has to be penetrated. The Bartow light also has the five degrees of intensity so intensity can be increased if necessary as the lights are coned in.

In effect, the difference between L-M-Bartow and the remainder of the lighting fraternity can be capsuled to brute force (higher intensity for penetration) vs. agility (controlled beam). This also is at issue in approach lighting, plus some idea that Jack Bartow has worked out over 15 years of studying lighting.

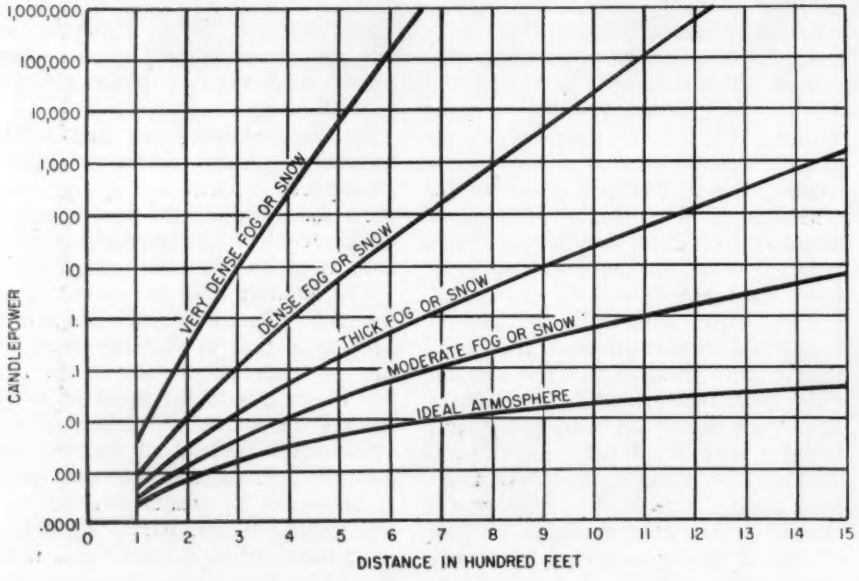
▶ **Approach**—Approach lighting of a sort has been used for a number of years, generally consisting of a short



Line Material (Bartow) approach light.



AGA approach light.



double row of red lights along the runway extension lines. But with the efforts to attain more reliability and safer instrument approaches, those few lights were acknowledged to be insufficient. Next step was to decide what would be better.

Approach lights do not comprise a bad-weather landing system. They are only one unit of such a system that must also include radio or electronic approach aids. But their role in all-weather landing is nicely catalogued in a statement by Lt. Col. Patrick R. Arnold, veteran commercial and AAF pilot: "In more than 700 instrument approaches in the Aleutians, I have never made an instrument landing, yet many of these landings were made at the time of official 0/0 weather reports."

In other words, Arnold spotted the approach lights far enough out to make a visual landing. The customary philosophy in tackling approach lighting is to increase the visibility of the lights. That means higher intensity all the time and has led to the design of very powerful lights carried out far enough (generally to the inner marker beacon) to orient the pilot in ample time for him to line up with the runway.

► **Westinghouse**—The two most powerful lighting systems being tested probably are those of Westinghouse and Sylvania. They have one thing in common: they use steady-burning and flashing lights. The flashers send a terrific burst of light for a fraction of a second. Westinghouse claims its Krypton Flasher gives forth a blast the equivalent of 3,300,000,000 cp. Sylvania's Strobeacon flasher unit is said to flash at about 8,000,000 cp.

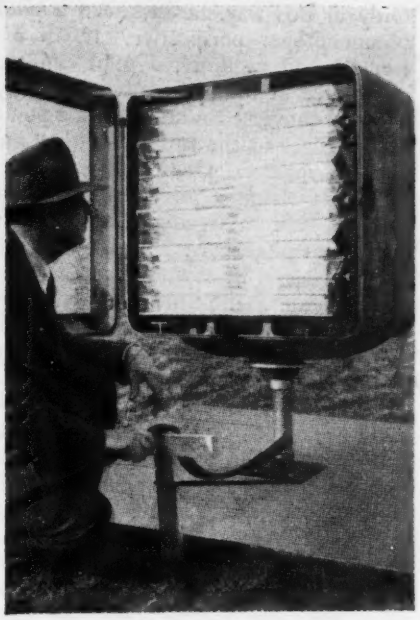
Westinghouse employs alternate flashers and steady-burning lights, 72 in all, along the runway centerline extension from 3225 ft. to the threshold lights. The so-called "blaze" lights (which also can flash as high as 10,000,000 cp.) produce a beam of 100, 1000 or 10,000 cp. The flashers operate in sequence beginning every 1½ sec. Result is that for about 3/100 of a second there appears to be a brilliant white streak pointing toward the runway. In between the flashes, or in conditions not restricted enough to require use of the flasher, the red neon "blaze" lights burn.

The Westinghouse system has been partially installed experimentally at Cleveland Airport, but has not been extensively tested.

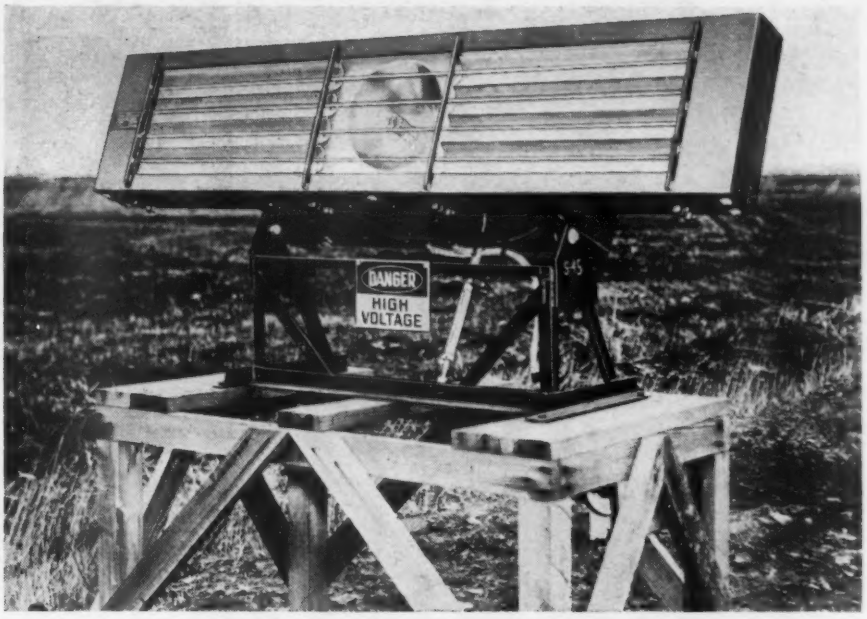
► **Sylvania**—The Sylvania light has both the flasher and the steady-burning light in one unit—flasher in the center of four neon bars. The lights are installed in a row 2800 ft. out from the end of the runway and in a line parallel to the runway centerline. Like the Westinghouse installation, they are spaced close together at the outer end, and farther apart toward the runway. Half of the 48 units have the flasher tube, the others do not. Also like the Westinghouse, the Strobeacon flashes in sequence so that a dart of intense white light points out the runway.

A complete set of Sylvania lights has been installed by the Air Transport Association for testing purposes at the approach to one runway at Newark airport. The installation was finished early this year. It has been used many times by pilots on regular passenger runs and reports are very favorable.

The flasher-type lighting installation was born out of the desire to use extremely high intensity to get penetration without serious glare. The theory is that the lights are not on long enough to blind or confuse the pilot. But to



Westinghouse approach light.



Sylvania approach light.

some experts, this very thing renders them insufficient.

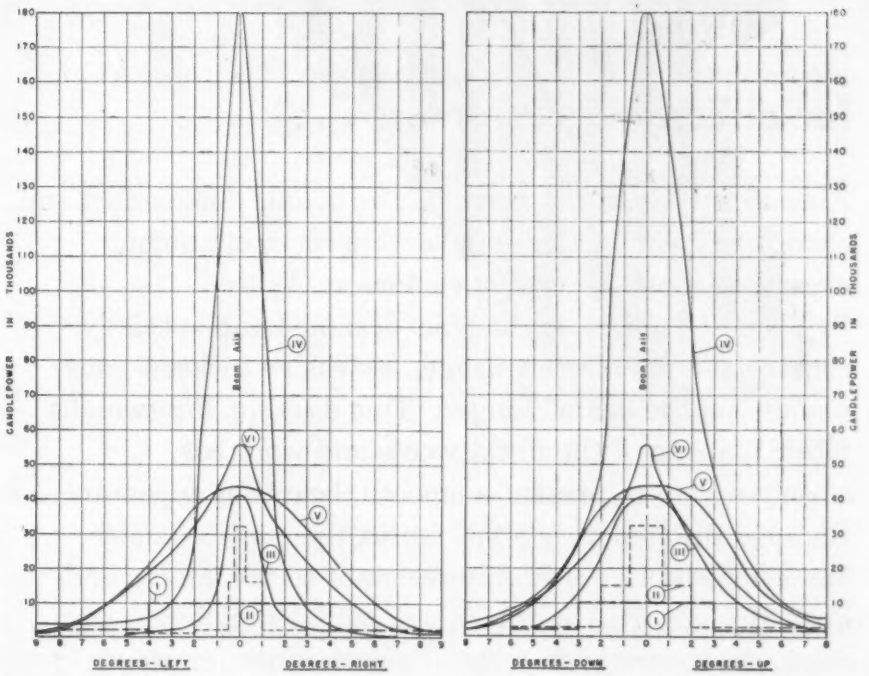
The value of approach lights, this argument runs, is that they give the pilot a "fix" on the runway. To do this, they must be continually lighted. When the pilot first picks up the lights, he should be able to follow them in and make a visual approach. In other words, after he has spotted the lights, he should be able to go off instruments.

But to make a proper approach without shifting his eyes from lights to instruments, the pilot must have some guide to his flight attitude and glide path. To give that guide, there have been several ingenious systems developed.

▶**American Gas Accumulator**—AGA, for instance, proposes a row of red lights on each side of the approach path. These are arranged in the shape of a funnel, with its mouth farthest from the beginning of the runway. The theory here is that the pilot will see both rows of lights and they will "funnel" him in to the runway. He is supposed to be able to retain proper flight attitude and glide path by centering on the rows of lights.

A more complicated system is sponsored by CAA. Known as the "slope-line" approach, it utilizes 29 units on each side of the approach zone centerline. Each unit is eight feet long and is mounted with the outside end nearest the ground so that it makes a 45 deg. angle with the horizontal. These units also are funnelled, and arranged so that if any pair (facing across the approach zone) were extended, the extensions would intersect along the proper glide path.

The result is that if a pilot is making a proper approach he sees only two straight lines of lights, one on each side of the approach zone. If he is off the proper glide path, either in azimuth or elevation, the lights appear individually at different angles.



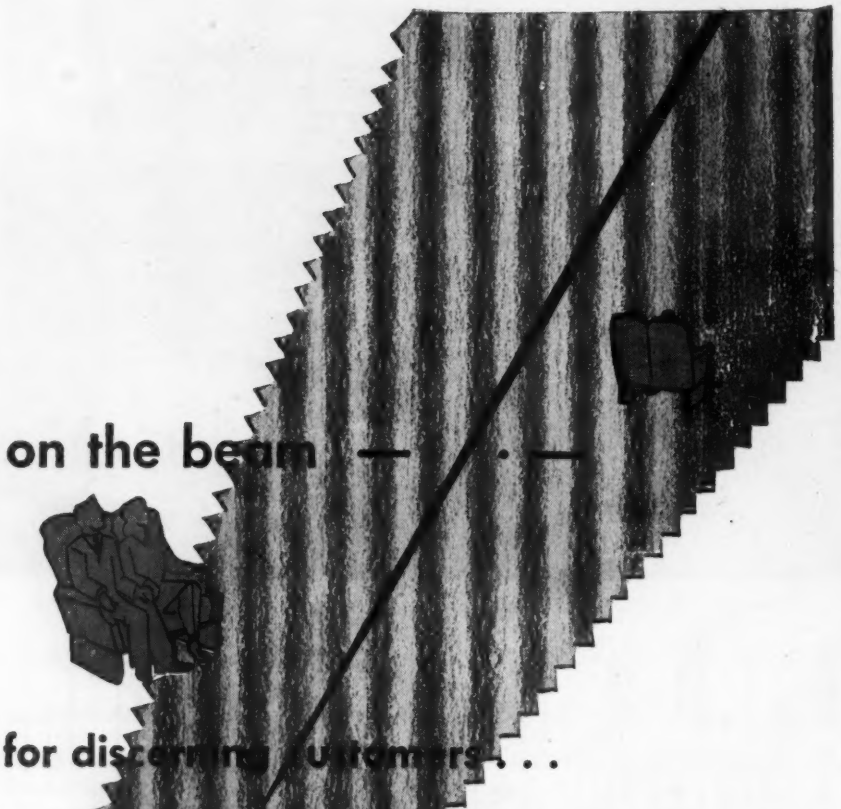
Runway light distribution: I, Air Force recommended; II, A. F. required; III, wartime Bartow; IV, Bartow controllable beam; V, AGA; VI, Westinghouse and Revere.

This system, as well as the AGA funnel lights and the Bartow multi-row approach light system, are all installed at the Landing Aids Experimental Stations, Arcata, Calif., which is operated jointly for CAA, Air Force and Navy.

▶**Perspective Theory**—The Bartow system also is installed at the Navy's testing center at Patuxent, Md., and has aroused considerable Navy support. Jack Bartow designed his system on the basis of one simple belief: every landing—in good weather and bad, and whether the pilot realizes it or not—is made by perspective. Perspective, invaluable to draughtsmen, is the phenomenon that all level and parallel lines appear to the eye to retreat or "vanish" toward a common point.

In making a landing, the edges of the runway appear as lines converging in the distance. The pilot uses these lines to establish his ground plane and as long as he knows they are level and parallel, can maintain proper attitude and glide path in relation to the lines.

In his approach lighting system (also manufactured and sold by L-M), Bartow attempts to prolong, in effect, contact flight. He insists that approach lights must be arranged in level, parallel rows in lines with the runway lights.



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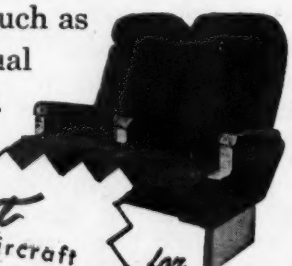

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Only in this way, he says, can a pilot obtain proper perspective. If, in extremely bad visibility, a pilot can see only three or four pairs of lights, they will still converge toward the same point as the edges of the runway—if they are laid out in level, parallel rows.

Bartow claims a pilot cannot obtain perspective from seeing three or four lights of a single row. Weakness of the funnel system, he says, is that the vanishing point of the lines formed by the approach lights is different than the vanishing point of the lines formed by the runway lights.

► **Multi-row**—Bartow now proposes several rows of level, parallel lights on each side of the approach zone. The exact number of rows and arrangement is still subject to further testing, but the system as in use at Patuxent and Arcata is: four rows on each side for 1000 ft. inward of the inner marking beacon; three rows for another thousand feet, two rows for another thousand feet; single row on each side from there to the runway. The right-hand rows of lights are green, the left-hand lights red.

Purpose of this arrangement is to provide extended coverage under conditions of extremely poor visibility. As disclosed in motion pictures taken during approaches of a Navy plane at Patuxent with a ceiling of 200 ft. and visibility one-eighth mile, only three lights at a time could be seen. During several of the approaches the pilot was so far off the centerline as he entered the approach zone that due to low visibility he could not see the lights on the other side of the zone. Because of the multiple rows and their colors, the pilot could tell whether he was to the right or left of the runway, and approximately how far off center.

(At Patuxent, the Bartow lights used are the controllable beam runway type. The Arcata installation is L-M's new approach light, peaking at 500,000 cp.)

► **New System**—For the time being, at least, it appears that the opposing merits of the Bartow multi-row, the funnel, the slope-line, and the flashers will be limited to arguments at Arcata and other experimental stations. All users concerned tentatively have agreed on a standardized approach lighting system—and none of the systems described above fills the bill.

After disagreement on the proper kind of approach lights became obvious last year, an intensive investigation was undertaken by a 12-man committee appointed by the Aeronautical Board. It consisted of representatives of CAA, CAB, the Air Force, Navy, Air Line Pilots Association and the Air Transport Association.

This committee studied the problem, and members flew the lights at Newark, Arcata and other places. Its re-

Line Material (Bartow) runway light.

Westinghouse runway light.

AGA runway light.

port recommended a single row of red lights placed along the left-hand side of the approach zone. This will be the system used commercially and installed with CAA funds (CAA in the fiscal 1949 budget has asked for money to put in 39 sets). The military system will be the red row on the left, plus an orange row on the right-hand side.

The services decided to supplement the red row with the orange row because their pilots have a lower level of experience than the airline pilots. If later the commercial system does not seem to be working out, it can be changed by the addition of the other row. This would then furnish the basis for a perspective and answer one criticism of the single red row.

But some airport lighting authorities have another complaint. It is the use of red lights. They make the point that red around an airport commonly is used to indicate danger, as in obstruction markers.

▶ **Color Penetration**—This fact was considered by the lighting committee. It gave thought to five different colors: yellow, green, white, blue and red. The decision was based on two factors: efficiency of the colors, and their present uses. Efficiency in one respect is not a matter of color. All colors penetrate fog equally. Degree of penetration, again, is a matter of candlepower. However, there is a loss of candlepower when the beam passes through the colored filter. The loss is smallest in passing through a clear lens, greatest in passing through a blue filter. Next to a clear lens come yellow, red and green.

Clear lights were discarded because they are used on the first two-thirds of the runway, for boundary lights, and because they might be confused with street lights. Yellow was discarded because this color now is used for warning zones and is too similar to sodium street lights. Green was turned down because it is used in rotating beacons and threshold lights. This left red and this color was chosen despite its use also in obstruction markers. The committee decided that since there would be a long row of red lights and the pilot would be making an instrument approach within fairly precise limits there was little danger of confusion.

There the approach lighting situation rests—at least for a while. In line with the committee recommendations, CAA has ordered from AGA red lights to be installed in a single row at Washington and Los Angeles. There will be other contracts of this type, possibly with other manufacturers. But while taking the business, none is giving up advocacy of its own particular type of approach light.

Wind Tunnel Optics Symposium Held

The first symposium on wind tunnel optics, a new field concerned with wind tunnel instrumentation with particular application to those operating at supersonic velocities, was sponsored recently by the National Bureau of Standards under the technical direction of Dr. I. C. Gardner, Optical Instruments Section, and H. C. Hahner, Glass Section Representatives of the services and government agencies concerned with the problem directly and through research contracts attended the informal program.

Usefulness of optics as a wind tunnel tool arises from the principle that the density of a compressible fluid is an index to its velocity. By measuring the changes in the index of refraction of the air moving in a wind tunnel created by pressure changes, a qualitative measure of its velocity may be determined. These pressure changes may be made visible through the use of interferometry or schlieren apparatus, and it is this field of refractometry that has been termed "wind tunnel optics."

▶ **New Field**—In the design, construction and use of such equipment, the well-established principles of optics are used, but the size of the equipment and the degree of accuracy required comprise an almost fresh field for the optical engineer and the glass maker. The symposium developed an exchange of information on the technique involved in the production of large discs, windows and mirrors of high-order accuracy in which optical heterogeneities are reduced to a minimum through casting and other methods.

One of the new refractometric methods disclosed during the discussions was the production of fringes through the use of heterochromatic light, which promises a broad new field of development both in the production of the equipment and in the analysis of the light patterns produced by the wind tunnel flow around test models.

Although this first symposium was confined to government agencies, future meetings are planned at the Bureau of Standards to which interested government contractors and civilian groups will be invited.

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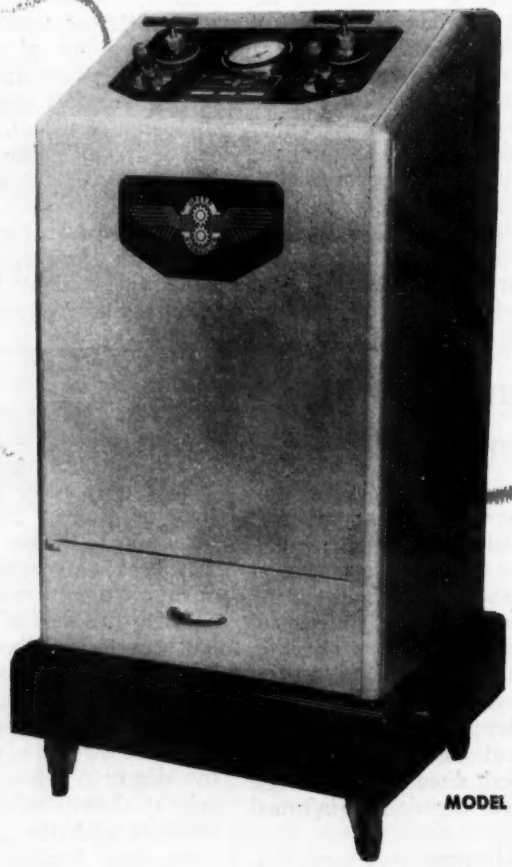

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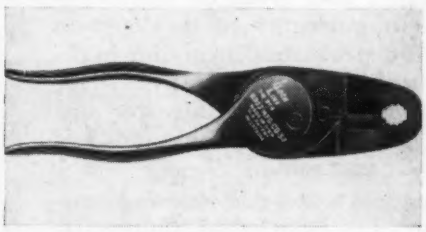
NEW AVIATION PRODUCTS

Circuit Tester

Seen as an aid to service technicians, maintenance engineers, production inspectors, and trouble shooters is new pocket-size wide-range circuit tester, series 40, made by **Precision Apparatus Co.**, 92-27 Horace Harding Blvd., Elmhurst, L. I., N. Y. Self-contained unit affords 31 a.c.-d.c. ranges to 6000v., 600 ma., 70 db., and 5 megohms. Meter has sensitivity of 400 microamperes, and rotary range selection permits two pin jacks to serve all standard functions. Multiplier and shunt resistors are claimed accurate to 1 percent. Set has following ranges: six a.c.-d.c. and output voltage (all at 1000 ohms per volt), 0-3-12-60-300-1200-6000v; 4 d.c. current, 0-6-6-60-600 ma.; 3 resistance (with self-contained batteries), 0-5000-500,-000 and 0-5 megohms; and 6 decibel from −22 to +70.



Self-Locking Plier

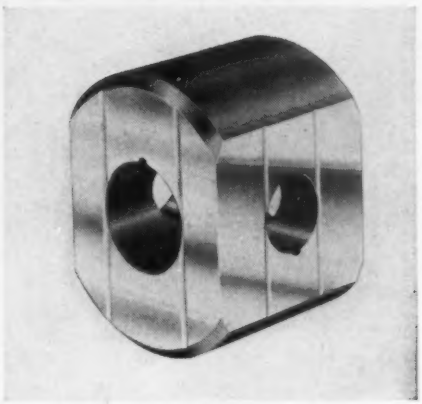
Aid to aircraft maintenance is new self-locking plier made by **Ross Manufacturing Co.**, 300 Montgomery St., San Francisco, Calif. Through special cam action, mechanism gives high cutting force claimed to have power ratio of 75-1. Designed to lock up to 11/16 in. at deepest jaw serrations, plier is said to strip object before relaxing grip.

Coaxial Switches

For monitoring and remote control of radio and radar equipment are newly developed coaxial switches made by **Designers for Industry, Inc.**, 2915 Detroit Ave., Cleveland, Ohio. Type C has VSWR less than 1.25:1 to 6000 mc.; less than 1.8:1 to 10,000 mc. Unit is single circuit, two position (SPDT) device for use with RG-8/U cable. Type D is fully automatic switch, rotated to positive position by remote selector. It is single circuit, six position (SP6T) unit also for use with same cable. Type Y has applications where power handling is a factor. Unit is single circuit, two position (SPDT) switch, suitable for use with RG-17/U cable. Impedance for all types is 52 ohms.

Trim-Tab Control Switch

Centralized, finger-tip control, TC-58-P master switch, for aircraft trim-tab system, is offered by **General Control Co.**, 1200 Soldiers Field Rd., Boston, Mass. Two levers actuate six switches governing forward and reverse fields of three electrical thrust motors which operate aileron, elevator, and rudder trim tabs. Four-position toggle lever actuates snap-action switches to control two motors providing trim for nose up, nose down, left wing down, and right wing down. Two position lever at top of unit energizes rudder trim tab motor for nose left and nose right trim. Snap-action switches, handling 10-amp., non-inductive load at 24v. d.c., afford quick make and break for positive d.c. switching no matter how slowly control lever is moved. Entire control unit is contained $3\frac{11}{16}$ x $3\frac{7}{16}$ x $3\frac{1}{2}$-in. housing. AN connector is wired in.



Reduces Joint Friction

New center block, claimed to minimize frictional heat in universal joints from $\frac{1}{4}$ to 4-in. o.d., has shallow grooves on each bearing surface, creating 16 small areas instead of four larger ones. Grooves are intended to reduce size of areas subjected to friction by causing more even distribution of wear, increased lubrication, and more uniform and rapid dissipation of heat. Maker is Curtis Universal Joint Co., Springfield, Mass.

Information Tips

Offers Instrument-Making Service

Through its new Short Run Shop, **Marion Electrical Instrument Co.**, Manchester, N. H., now manufactures sample radio, electrical and electronic instruments to customer specifications. Time and trouble of improvising special units is thus saved user, who need only specify internal resistance, dial calibration, pointer style, sensitivity, overload capacity, damping factor, and the like, to the New Hampshire company, which states it can delivery finished instruments approximately two weeks after order.

Cutting Fluids

Booklet containing detailed recommendations for selection of cutting fluids as well as pertinent information on use of metal working tools is offered to aviation machine shop personnel by **Standard Oil Co., of N. J.**, 15 West 51 St., N. Y. C. Illustrated catalog contains specifications on machinability rating and chart on suggested cutting-fluid applications.

Flexible Hose

Bulletins 27 and 28 issued by **American Ventilating Hose Co.**, 15 Park Row, N. Y., deal with lightweight, flexible hoses for use in aircraft industry. Hose and installation data are covered.

Engineering Photographic Aids

Three new booklets are available from **Eastman Kodak Co., Industrial Photographic Div.**, Rochester, N. Y. "Magnifying Time" describes use of Kodak high-speed camera to analyze motion too fast for study by unaided eye. Second booklet is analysis of projection papers for use with enlargers or process cameras. Data on contact paper for photocopying and engineering reproduction are offered in third.

Grinding Compilation

Comprehensive information on principles of grinding is offered in 137-page manual "Grinding Facts," as an aid in selection, identification, specification, application, and care of grinding wheels. Issued by **Carborundum Co.**, Niagara Falls, N. Y., booklet includes extensive section on wheel gradings for grinding operations.

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States Likely to Police Air Safety

Federal, state and industry representatives favor Congressional action to delegate enforcement power.

By Alexander McSurely

State enforcement of federal aviation safety regulations seems likely to get Congressional authorization on a basis of early analysis of hearings on H. R. 6147 and S. 2452, duplicate bills now in committee, which would provide for such authorization.

Supported by the powerful Congressional Air Policy Board as one of the planks in the Board's platform for government action to aid aviation, the proposed legislation found support in principle also from CAB. CAA and Personal Aircraft Council supported it with additional reservations, and Air Transport Association proposed "an important amendment" to provide for uniform economic regulation of all air carriers under a single federal agency. National Association of State Aviation Officials approved the principle of state regulation but asked for greater state authority than the bills would provide.

▶ **Proposed Bills**—Bills proposed amending Civil Aeronautics Act of 1938 to permit state courts to suspend airman certificates for violation of air traffic rules promulgated by CAB, not more than 30 days, with opportunity for hearing before expiration of that period. They would also permit state court or agency suspension of airworthiness certificate, airman certificate or air agency certificate for violations of CAB regulations for six months, after notice and opportunity for hearing.

Bills provide that when any action is commenced in a state court or agency, a copy of the complaint would be filed with CAB, and a copy of final judgment in the action also would be entered with CAB.

A further provision states that "no state, territory or possession of the U. S. or political subdivision thereof, shall without consent of Congress, impose upon any person any prohibition or requirement which relates to the same subject matter as any provision of Title VI of this act." (Title VI gives authorization for federal regulation of aeronautical safety, to the Civil Aeronautics Authority (CAA and CAB).

▶ **CAB Testimony**—One of the most significant statements in hearings, supporting the granting of state enforcement powers was that of Emory T. Nunneley, Jr., general counsel of CAB. Nunneley frankly warned that despite efforts of CAA and CAB a backlog of safety cases which is carried over from year to year, is steadily increasing.

"During fiscal year 1946," he reported, "428 complaints seeking suspension or revocation of safety certificates were filed with the Board by the Administrator. In fiscal year 1947, 881 such cases were filed and for the first nine months of fiscal 1948, 660 were filed. Despite the fact that the number of such cases disposed of each year increased from an annual rate of 300 in fiscal 1945 to 760 in the current fiscal year, the backlog of such cases pending before the Board has increased from 94 on July 1, 1945 to 707 at Mar. 31, 1948. As can readily be seen, this is approximately one year's work for the Board's present staff of safety hearing examiners.

▶ **Officers Reluctance**—"Finally there is reason to believe that there may be reluctance on the part of the enforcement officers to institute suspension and revocation proceedings in face of the size of the backlog and the period of time during which the complaint will be hanging over the head of the alleged violator with the result that the number of suspension and revocation cases is less than might be received if the docket were reasonably current."

Nunneley warned that unless an unprecedented federal staff expansion takes place, the backlog of cases is likely to continue to increase further as a result of rapid growth of air traffic. Number of pilots holding all grades of airman certificates has swelled from 22,983 in 1938, to 455,000 in 1947. Number of certificated planes has grown from 10,814 in 1938 to 93,920 as of June 30, 1947.

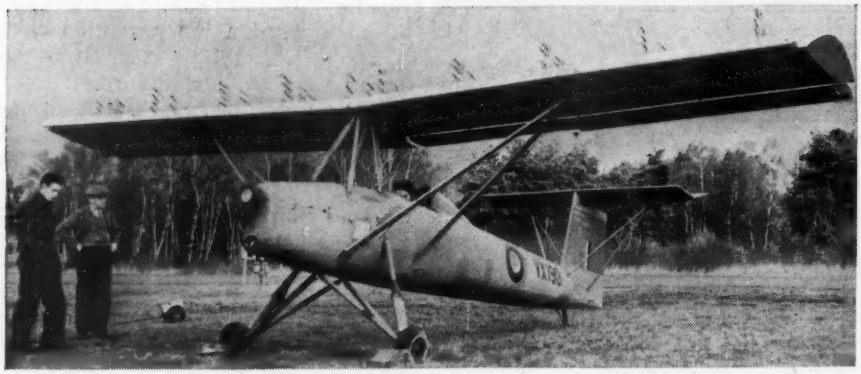
▶ **Changes Urged**—He recommends changing maximum suspension allowable to one year to coincide with maximum CAB certificate suspension, instead of the 90 days provided in the bills. He expresses doubt that uniformity of state aviation regulation action can be obtained through the medium of model state aviation laws, in view of unfavorable past experience with this method.

Clarence Cornish, Indiana state aeronautics director and president of NASAO, told the House and Senate hearings that the states "should have a greater voice in the promulgation of regulations they are being asked to enforce." He objected that the present bill had been drafted and presented without any consultation with state government representatives who would ultimately have to enforce it. As a result questions of venue and jurisdictional proceedings in state courts and agencies have been overlooked. The bill as presently written is not acceptable, and should be revised into a bill drafted by cooperative effort of federal and state aeronautical agencies, he contended.

▶ **CAA View**—A CAA spokesman expressed the view that no airman certifi-

CESSNA FERRY PILOTS

Steve Wittman, famed racing pilot and Oshkosh, Wis., fixed base operator, and Howard Morey, a Cessna distributor, take over two new Cessna 195's at the Wichita factory for delivery to Sao Paulo, Brazil. Shown above are Don Flower, Cessna sales manager; Wittman; Mrs. Wittman, Dr. Adelai Schivetton; Mr. and Mrs. Morey.



BRITISH TEST GERMAN SLOWPLANE

A 51-hp. captured German experimental plane capable of operating from a landing area 22 by 88 yd. in size is being tested by the British government at the Royal Aircraft Establishment. The Zaunkoenig will fly at 31 mph. with full aileron control. Wool tufts on top of wing photographed from a helicopter in flight have demonstrated that the outer portion of the wing remains unstalled, and lateral control is maintained with flaps up at 38 mph. Design offers interesting possibilities.

cates except those with pilot rating should be open to state suspension, and that foreign pilot certificates should be exempt from state action, because of international law. Clarification was asked as to whether state action would be concurrent or would preclude federal action. The six months maximum suspension provided, would result in violators seeking to have cases tried by the state, if the state court precluded federal action, CAA believes, since federal trial might result in a severer sentence.

While NASAO contended that notification of complaints and judgments to be filed with CAB, was "cumbersome and unworkable in practical application," the CAA spokesman urged that such notification from state authorities was necessary to prevent duplication.

CAA asked further for a clear statement of the "type of case tryable in the state court," and adoption of safeguards for uniform interpretation of CAR in the state courts and uniform penalties, with adequate enforcement for a state court's suspension orders in other states.

▶ **CAA Warning**—CAA also sounded a warning: "Unless there is a clear demand on the part of the states the authority granted in the legislation is likely to be indifferently exercised which would be worse than no legislation at all."

Robert Ramspeck, ATA executive vice president, favored adoption of the basic bill with an amendment reserving to the federal government exclusive economic regulation of air carriers engaged in interstate air commerce. The amendment would prevent interstate air carriers from being regulated by both the states and federal government, but would not affect state regulation of the purely intrastate operator, or prevent states from regulating interstate air carriers as they regulate other business corporations.

Ramspeck warned of economic regulatory powers already vested in state regulatory officials in 27 states, not yet exercised extensively, but a strong potential regulatory threat. He urged a need for determination of the extent to which state regulations can be applied to the intrastate operations of interstate air carriers. He cited the virtual freedom of railroads from local economic regulation, as a pattern which should be followed in the case of the air carriers as another form of interstate transportation.

Referring to safety regulation he pointed out the multiplicity of existing federal aeronautics safety regulations and urged that Congress should not hesitate to reserve to the federal government the sole power and duty of regulating safety in flight by anyone, anywhere in the U. S. However, he supported the bill's provision for state enforcement of the federal regulations, and approved the bill as a clarification of relationships between state and federal governments.

Joseph T. Geuting, Personal Aircraft Council manager (Aircraft Industries Association) voiced opposition to the right of state courts and agencies to suspend certificates, urging that civil penalties can be enforced by local authorities without allowing them to void even for a limited period, federal certificates. He urged that any state enforcement of air traffic rules be limited to personal aircraft operation, and warned against duplication of penalties and enforcement by state and federal authorities. State regulation of scheduled and non-scheduled airline operations and cargo operations would retard and hamper air transportation "to such a degree as to be a calamity" he said.

Balfour Re-elected President

Capt. Maxwell W. Balfour, director of Spartan School of Aeronautics, Tulsa, was re-elected president of the Aeronautical Training Society at their annual membership meeting in Dallas.

Major C. C. Mosely, vice president, and Wayne Weishaar, secretary-treasurer, were also re-elected.

Balfour has been engaged in military and civil aviation since World War I. His school is known as the world's largest aviation technical and flight school.

Mosely, president of Cal-Aero Technical Institute, Los Angeles, is also a veteran flight school and airport operator.

Headquarters of the Society continues at 1025 Connecticut Ave., Washington, D. C., with Weishaar in charge.

Named as directors: E. Merritt Anderson, Anderson Air Activities, Milwaukee; Hal S. Darr, Monarch Airlines, Chicago; William J. Graham, Graham Aviation Co., Pittsburgh; William R. Kent, Southern Air Service, Memphis; Maj. William F. Long, Dallas Aviation School, Dallas; John G. McKay, Embry-Riddle Company, Miami; Clarence E. Page, Page Aviation Services, Oklahoma City; Oliver L. Parks, Parks Aircraft Sales & Services, East St. Louis, Ill.; Ben T. Smith, Southeastern Air Services, Atlanta; Harry S. White, Palo Alto Airport Co., Palo Alto, Calif.; Capt. Balfour and Maj. Mosely.

120 Minnesota Markers

Plans for installation of 120 air markers in small Minnesota communities have been announced by Leslie L. Schroeder, state aeronautics commissioner. Markers will conform to standard CAA specifications except for inclusion of latitude and longitude figures which will be added only if CAA funds are available to cover the additional cost.

It is expected the entire project of air marking will be completed by July 15.

Wind Damage

A freak wind storm caused damage estimated at $25,000 at Tomah, (Wisc.) airport. The hangar was torn from its concrete moorings and hurled about 300 feet across a highway, and seven small planes were wrecked. Five other small planes, outside the hangar at the time, were undamaged. A wing of one of the wrecked planes was found a quarter of a mile from the airport. Victor Bloye, airport operator, was aloft in his plane when the storm struck without warning. He remained in the air until it abated, landing unharmed.

CAA Advisory Committee Gets Six New Members

Six newly appointed members of the CAA Non-scheduled Flying Advisory Committee will meet with the committee June 15, in Washington.

The group, named by Fred Lee, acting CAA Administrator, includes: Leighton Collins, editor of Air Facts, New York; Harold Wood, Birmingham automobile dealer; Henry von Berg, president of Pathfinder Flying Service, Stockton, Calif.; Dr. Harvey L. Casebeer, persident of Butte, Mont., Chamber of Commerce; J. B. Hartranft, jr., general manager, Aircraft Owners and Pilots Association, Washington; and Prof. Lynn Bollinger, Harvard University.

Holdover members of the committee are: William L. Anderson, Pennsylvania state aeronautics director; Oliver L. Parks, head of Parks Aircraft Sales and Service, East St. Louis, Ill.; F. L. Marsden, Buffalo, N. Y., Aeronautical Corp.; William H. Klenke, jr., sales manager, Stinson division, Consolidated-Vultee Aircraft Corp., Wayne, Mich.; George E. Haddaway, publisher of Southern Flight, Dallas; and Chairman Don Flower, sales manager of Cessna Aircraft Corp., Wichita.

Retiring members are: William A. Mara, advertising manager, Bendix Aviation Corp., Detroit; Harry Playford, president, U. S. Airlines, St. Petersburg; Prof. Fred E. Weick, Texas A. & M. College, College Station, Tex.; and Ed. Williamson, Seattle, bearing manufacturer. Richard H. Depew, jr., the sixth member, died recently.

Addition of the new members, Lee said, continues to give CAA a strong advisory committee with wide representation of various nonscheduled flying interests throughout the country.

Plane-Fishing

Most commercial fishing is done from boats, which require extensive investments and sometimes fairly large crews. Their range, too, is limited.

Clem Simmons of Seattle, Wash., is trying a new approach to commercial fishing in Alaska this year, using a plane instead of a boat. Last year, he used a 65-hp. J3 Cub, mounted on pontoons, and in one day made three trips to the cannery, making a total of $96 for the day. This year, he has a larger Grumman amphibian with excess equipment removed to make room for nets, floats, etc. Simmons figures the plane will carry more than a ton of fish.

By using the plane, Simmons is able to move from place to place as the fish are running. With Mrs. Simmons, he lands at a likely-looking spot, taxis up on the beach, gets out the nets and seines for salmon.

BRIEFING FOR DEALERS & DISTRIBUTORS

OFFICE OF AVIATION SAFETY—Re-designation of CAA Safety Regulation Division as the "Office of Aviation Safety" and renaming of the division's inspectors as "Agents" is another in a series of pointed indications to CAA men in the field that the Washington CAA headquarters wants them to be primarily promotors of aviation rather than policemen.

"The agent meets the flying public on the grassroots flying field and the huge terminal airport," Fred Lee, acting CAA administrator said in announcing the change. "Although it is his assignment to see that Civil Air Regulations are respected, and obeyed, vet 90 percent of his work is in cooperative assistance to those who use aviation for pleasure or to whom it is a livelihood. There are still in aviation the few who fly recklessly or operate carelessly, and it is for these that the regulations were written. But the great mass of people in aviation meet the Agent as an advisor, friend and guide."

Lee is right about a number of CAA personnel, but his statement remains an ideal rather than an actuality in too many cases. Changing some individuals from inspectors to agents may take more than the redesignation. But it is another step in the right direction as far as Washington policy is concerned.

PLANE RENTALS—Approximately $75,000 remaining in CAA's aircraft maintenance and operation fund for fiscal 1948 will be available for renting airplanes for CAA personnel to use in field trips. A fund of $395,000 is in next year's budget for the same purpose. Most of this will be used for lightplane rentals, although CAA will continue to operate a limited number of heavier planes for specialized purposes, such as checking air navigation.

Noisy, expensive war surplus advanced trainers with which its field personnel have been equipped will be abandoned. Experiences in CAA's West Coast Sixth Region have shown that postwar lightplanes can be rented for less than $12.50 an hour, while it is estimated that it costs $25 an hour to operate the war surplus planes. Plane rentals will be in two categories: 1. Planes with payload of pilot, passenger and 40 lb. baggage allowance; and 2. Planes with payload of pilot, two passengers and 120 lb. baggage allowance.

Bids will be taken from operators for rentals, including allowance for maintenance and repair work to be done by the operators.

NATIONAL AIR TOUR—Participation in the Second National Air Tour the week of July 2 to 9 is expected to exceed that of last year by a goodly margin according to information received thus far by United Pilots & Mechanics Association, Washington, D. C., which again is coordinating the state flights. Last year 30 states arranged tours, some of them cooperative affairs with other states. State aeronautics directors are being asked to complete state tour committee appointments promptly.

AVIATION EDUCATION BOOMS—Largest summer aviation education program this country has yet known is projected in a program of summer "aviation workshop" courses for teachers in 62 colleges in 33 states, Link Aviation, Inc. reports. While the majority of the courses will be short three-and four-day affairs, N. Y. State Teachers' College at Cortland is planning a six weeks' course in Air Age Science July 5 to Aug. 13.

SPIN-STALL ACCIDENT DECLINE—Spin-stall accidents are declining, the CAB accident analysis division reports on the basis of a tabulation of the first 1000 non-air carrier accidents of 1948. The comparison is with the first 1000 accidents of 1947.

A total of 97 spin-stall accidents was reported for the 1948 group as compared to 116 for the 1947 group, or a decline of 19 accidents. Of the 97, instructional spin-stalls amounted to 28, non-commercial totaled 61, and commercial and miscellaneous totaled eight. Drop in fatalities accompanied the decline in spin-stall totals. Report showed 31 deaths resulting from spin-stall accidents in the 1948 accidents analyzed so far, as compared to 45 in the first 1000 accidents analyzed last year.

While additional accident reports will be required to show whether the trend is maintained, the presumption is that postwar spin resistant and spinproof airplanes and the use of stall warning indicators, are combining to curtail effectively some of the toll which has been taken in the past by this type of accident. (In the past two years, Safe Flight Instrument Corp. reports, 4000 airplanes of all types have been equipped with that company's stall warning indicator. Comparable data are not available on other types of stall indicators.)

—ALEXANDER McSURELY

FINANCIAL

Last-Minute Reprieve for TWA

A CAB award of additional mail pay saves TWA from defaulting on sinking fund payments due Equitable.

Reprieved by a last minute mail pay award from the Civil Aeronautics Board, Transcontinental and Western Air, Inc., avoided defaulting on sinking fund payments due last week to the Equitable Life Assurance Society.

▶**More Mail Pay**—CAB granted TWA approximately $1,100,000 in additional mail pay on its foreign routes, at the rate of 60 cents a plane mile retroactive to Jan. 1, 1948. The estimated additional mail compensation equaled the sinking fund payment due May 28 on the company's debentures. Equitable holds the entire $40 million in debentures issued by the carrier. Were the sinking fund payment defaulted, the loan from the insurance company along with $8 million in bank loans would have become immediately due.

In that event, it was assumed that control of the airline would have passed to Equitable. This has now been averted, temporarily at least.

Among the desperate last-minute moves attempted by the airline was an application to the Reconstruction Finance Corp. for a $10 million loan. RFC refused to grant any advances during 1947 under more favorable circumstances, and it is considered unlikely now that aid will be forthcoming from this source.

▶**RFC Amendment**—It is not generally appreciated, but before RFC can advance a loan to a certificated air carrier CAB must certify that such airline "may be expected to meet its fixed charges without a reduction thereof through judicial reorganization." This provision is in an amendment made June 30, 1947, to the RFC act. CAB has made only one such certification, in the case of Western in September, 1947.

Were the Board to certify a RFC loan to TWA under such circumstances, it would imply that sufficient mail pay adequate to service this advance would be forthcoming. At the present time, TWA has a number of major mail rate proceedings pending before CAB, and in courts. A CAB endorsement of a RFC loan would, in effect, prejudge these mail rate cases.

▶**Bank Credit** — Temporarily in the background but likely to assume increasing importance, is the $18 million bank credit established to permit the airline to finance the purchase of 12 new Constellations. Only $8 million of this credit has been drawn upon thus far and that was the amount which would have become immediately due upon default of the sinking fund payments on the debentures.

This bank credit was endorsed by Lockheed on a chattel mortgage basis in order to facilitate the sale of the planes. Further, Curtiss-Wright Corp. had agreed to accept TWA notes in payment of the Wright engines to be used in the planes, rather than discount such paper at the banks similar to the Lockheed practice. In other words, if and when TWA should default on this bank loan, the banks will have recourse to Lockheed for its share of the liability.

▶**Previous Crisis**—One of the major enigmas is the course to be pursued by the Hughes Tool Co., owner of 46 percent of the 985,929 TWA shares outstanding. The Hughes interests also own a $10 million convertible note representing the funds advanced to meet a previous crisis in 1947. This note is no longer payable in cash but can be liquidated only through conversion into common stock any time before June, 1956. It is exercisable, at the holder's option, at the average closing market price ten days previous to the date on which exercised. The conversion price cannot be lower than par value, $5 per share. There are a total of 2 million unissued shares reserved for this purpose. For all practical effects, the lower the price sinks, the greater number of shares Hughes may obtain through conversion.

Should the option be exercised at 10, exactly one million shares will be acquired, bringing Hughes' total equity position to about three-quarters of the airline's outstanding stock. At the bottom price of 5, over 80 percent of the total would be acquired. In viewing this sliding scale of possibilities, it is not too difficult to appreciate why Hughes, while being able to buy a controlling interest in RKO for more than $8 million, is reluctant to place additional funds in TWA.

▶**Further Reduction**—The National Association of Insurance Commissioners, through its Subcommittee on Valuations of Investments, after first placing a price of 75 percent of face value, on the TWA debentures only a few months ago effected a further reduction to 60. In other words, as of Dec. 31, 1947, Equitable was directed to carry its $40 million TWA loan on its books at $24 million.

The only other airline loan which is privately placed is that of United Airlines. Metropolitan Life Insurance Co. holds $10 million and Mutual Life owns $2 million of that carrier's debentures. The insurance commissioners have directed that these bonds be written down to 85 as of Dec. 31, 1947. Thus far, United has fulfilled all requirements of its indenture and is in no immediate danger of defaulting.

▶**AA Debentures** — American Airlines has a $40 million debenture issue outstanding, which unlike the TWA and United loans, has a "free" market with daily quotations prevailing as a result of wider public distribution. American's bonds are currently quoted around 78. Equitable also owns $20 million of the American debentures.

It is highly probable that Equitable may be drawn closer into the management affairs of TWA.

▶**Excellent Job**—It is ironic, but Equitable's apparent lack of understanding of airline operations is primarily responsible for TWA's present complications. The carrier is known to be doing an excellent job from the standpoint of operations. The basic difficulty stems from the financial policies pursued a few years ago.

In lending TWA first $30 million and later an additional $10 million, Equitable did not insist upon additional equity capital being brought into the airline at the same time. The loans were assumed to be self-liquidating through depreciation charges on such equipment. Past experience has adequately demonstrated that the inauguration of new routes and equipment is patently expensive and requires considerable time before achieving profitable results. Further, in the highly leveraged TWA picture, a few adverse developments would wreak havoc with the company's finances. Unfortunately, through circumstances beyond its control, TWA ran into rough financial weather. Funds designed to purchase new equipment were utilized to meet operating expenses.

▶**Equity Money**—If Equitable had conditioned its loans upon more equity money being brought into the company at the same time, it is probable that TWA's capital structure would have been strong enough to ride out the recent storms.

At the present time the basic financial problem remains, and at some point a recasting of the company's capitalization appears inevitable.—**Selig Altschul**

More Deficits for Domestic Lines?

With first-quarter reports still showing heavy losses, 16 trunklines face third successive year in red.

The domestic trunklines are following the 1947 financial course. They have started 1948 with the same severe losses that marked last year's first quarter. And they wound up that year with the worst deficits in their history.

On the basis of a $15,700,396 net loss in the first three months of 1948, the 16 companies face the prospect of a deficit for the third successive postwar year. In 1947, the carriers had a $15,880,402 deficit in the first quarter and finished the year more than $20,000,000 in the red.

▶**DC-6 Grounding** – Except for the continued grounding of the DC-6s, first-quarter 1948 probably would have been far better than the same period last year. With the DC-6s now back in service and traffic on its seasonal upswing, the industry hopes to cut 1948's deficit considerably under the 1947 level.

But only a phenomenal growth in business combined with sharply increased mail pay could give the carriers an overall profit this year.

Worst losses in first quarter were reported by American Airlines and United Air Lines, which were hit hardest by the DC-6 grounding. American showed a $5,053,509 net loss for the three months, compared with a $2,922,951 red figure in the same 1947 period; United had a $3,401,293 net loss on domestic operations in the first quarter this year against a $3,217,671 deficit last year.

▶**Deficit Cut by TWA**–In contrast, TWA, unaffected by the DC-6 grounding, cut its first quarter domestic deficit from $3,741,398 in 1947 to $1,486,484. Northwest Airlines, the fourth transcontinental carrier, had a net loss of $1,970,193 in first quarter 1948 against $1,298,624 last year.

Aided by the National Airlines strike, Eastern Air Lines' first quarter profit spurted from $564,595 in 1947 to $1,121,144 this year. National, which together with Eastern was the only domestic trunkline to show a profit in first quarter 1947–$208,672–had a thumping $719,980 loss during the first three months of this year. With its best traffic season now past, and the strike continuing, National's profit outlook for the remainder of the year is bleak.

▶**Better Showing**–Among the smaller carriers, Capital, Chicago & Southern, Colonial and Continental showed major reductions in the size of first-quarter 1948 deficits. Deficits reported by Delta and Mid-Continent were up.

1st Quarter Earnings

(Domestic Operations Only)

Carrier	Net Profit 1st Quar.'48	Net Profit 1st Quar.'47
American	$(5,053,509)	$(2,922,951)
Braniff	(510,209)	(510,364)
Capital	(1,245,858)	(2,309,704)
C & S	(334,794)	(522,452)
Colonial	(161,068)	(451,353)
Cont'l	(96,385)	(221,109)
Delta	(531,876)	(201,350)
Eastern*	1,121,144	564,595
Inland	(25,920)	(60,527)
MCA	(104,914)	(59,693)
National	(719,980)	208,672
NEA	(524,229)	(516,133)
NWA	(1,970,193)	(1,298,624)
TWA	(1,486,484)	(3,741,398)
United	(3,401,293)	(3,217,671)
Western	(654,828)	(620,340)
Totals	$(15,700,396)	$(15,880,402)

(Parentheses indicate loss)
** Includes Puerto Rican service.*

Total operating revenues of the domestic trunklines in first-quarter 1948 were considerably higher than last year. But expenses also jumped.

Spurred by two 10 percent fare increases, passenger revenues gained around 15 percent despite a five percent decline in traffic (AVIATION WEEK, May 24). Mail and freight revenues also gained.

▶**Overseas Services**–Meanwhile, U. S. international operators also lost heavily during first-quarter 1948. On the basis of temporary mail rates, TWA had a net deficit of $2,427,750 on its overseas services, and American Overseas Airlines was $1,983,462 in the red.

Pan American Airways reported $459,553 net profit on its Atlantic operations, $174,003 profit on Pacific services, $15,293 profit on the Alaskan run and $80,537 net loss on Latin American routes. The figures are based on anticipated receipt of $4,113,413 in mail revenue above that actually earned under present temporary rates.

Northwest showed a $126,410 net profit on its Orient routes in first-quarter 1948. United lost $149,241 on its Hawaiian run, Colonial lost $5,902 on Bermuda operations and National was $82,837 in the red on its Havana services during the first three months of the year, while Chicago & Southern earned $17,503 on its Havana route.

$3,000,000 HOME FOR AA FLAGSHIPS

American Airlines has transferred the last of its installations at Chicago Municipal Airport to this huge new hangar with over two acres of space for garaging and maintaining planes as well as three floors of offices, stock rooms, restaurants and a medical center. About 620 ft. long and 240 ft. deep, the structure consists of two bays, each affording a clear span of 275 ft. and a depth of 175 ft. Eight Convair-Liners or six DC-6s and two Convairs can be serviced simultaneously in each bay.

Cases Reopened

CAB has reopened its Mississippi Valley Area case to determine whether Continental Air Lines or Mid-Continent Airlines should be selected to operate the Kansas-City-Jefferson City-St. Louis route originally awarded to MCA last December. Establishment of feeder service in Louisiana, Mississippi and Alabama, and between points in that area and Memphis, Tenn., also will be reconsidered.

FORERUNNER OF NEW BRITISH AIRLINER

Fastest and largest military transport in production for the RAF, this Handley Page Hastings will have a civil counterpart in the Hermes IV airliner. Major differences in the civil aircraft will be a longer nose and a nose-wheel undercarriage. Both types are powered by four Bristol Hercules radial engines. BOAC has ordered 25 of the Hermes transports for use on Empire airline routes. The Hastings shown above has been on a tour of Australia and New Zealand following a flight from England.

Record Overseas Traffic Likely

U. S. lines prepare to carry bulk of summer tourist load, but foreign competitors push expansion plans.

Airline traffic over the North Atlantic should set new records this summer—and U. S. carriers are preparing to handle the bulk of it again.

But competition from foreign flag lines is building up to new peaks. The next three months should show whether American operators can continue to pace the field by their usual wide margin.

▶**More Flights**—Flying exclusively with U. S. equipment—Constellations, DC-6s and DC-4s—the foreign operators are planning a much greater evpansion of their North Atlantic service than are their American competitors.

Air France, KLM, Sabena and Scandinavian Airlines System, which together operated a maximum of 18 trans-Atlantic roundtrips weekly last summer, will get up to at least 30 flights weekly this year. BOAC is operating six roundtrips weekly—same as last summer—while Swissair, which received its foreign air carrier permit last fall, is also in the field.

The three U. S. carriers in the North Atlantic service—Pan American Airways, American Overseas Airlines and TWA—are expected to have little increase in service. Last year, American operators flew around 80 roundtrips weekly during the peak season, or about 75 percent of the total.

▶**Survey Results**—Returning from a recent survey trip, Willis G. Lipscomb, PAA's vice president in charge of traffic and sales, estimated that travel this summer between the U. S. and Europe will be 25 percent above the same 1947 period. The Olympics in England, devaluation of the franc in France, and better economic conditions generally are expected to attract tourists. A war scare seems the only thing that might interfere with the expected boom in travel abroad.

Upward trend in trans-Atlantic air traffic during the postwar period is disclosed in a study just completed by the Civil Aeronautics Board. Overseas passengers funneling into and out of New York rose from 37,845 in the first half of 1946 to 67,135 in the second half of 1946, 80,108 in the first half of 1947 and 114,128 in the second half of 1947.

▶**U. S. Share Drops**—But as foreign flag lines began trans-Atlantic operations, and as they acquired additional modern U. S. equipment, the percentage of total trans-Atlantic traffic handled by American operators declined. During the first half of 1946, U. S. carriers' share of all passengers flown was nearly 95 percent. This figure dropped to 76.8 percent in the last half of 1946, to 75.4 percent in the first half of 1947, and to 71.2 percent in the second half of 1947.

There was an accompanying decline in the percentage of trans-Atlantic flights made by U. S. operators. In January, 1946, American carriers accounted for over 97 percent of all trans-Atlantic trips into and out of New York. By January, 1947, the percentage had fallen to 73 percent and by December, 1947, to 69.7 percent.

▶**Average Loads**—From July to December, 1947, American carriers transported 77.3 percent of all U. S.-citizen air travelers passing through New York on trans-Atlantic routes and 65.6 percent of all foreign citizens.

U. S. carriers during this period flew 81,305 passengers in both directions, of whom slightly more than half were American citizens. Foreign carriers flew 32,823 passengers, of whom 20,430 had foreign citizenship and 12,393 U. S. citizenship.

Average passenger loads carried by U. S. and foreign trans-Atlantic lines during the last six months of 1947 varied little. BOAC was first with 28.3 passengers per flight, followed by Pan American with 27.2, TWA 26.9, Air France 26.4, Sabena 25.2, American Overseas 24.5, KLM 23.1 and Scandinavian Airlines 22.7. Average of the American carriers was 26.2 passengers per flight and for foreign operators 25 passengers per flight.

▶**Carriers Rated**—Pan American Airways operated the most trans-Atlantic flights—1271—and carried the most passengers—34,578—during the last half of 1947. Other totals were AOA, 1073 flights and 26,302 passengers; TWA, 760 flights and 20,425 passengers; BOAC, 300 flights and 8484 passengers; Scandinavian Airlines, 360 flights and 8182 passengers; Air France, 247 flights and 6531 passengers; KLM, 282 flights and 6527 passengers; and Sabena 123 flights and 3099 passengers.

A survey made in September, 1947, showed that London, with 6154 passengers, originated and received the most trans-Atlantic traffic bound to and from New York. Paris was second with 2401 passengers, followed by Shannon 2024 passengers, Brussels 1322 passengers, Lisbon 900 passengers and Prestwick, Scotland, 808 passengers.

Traffic Rise for Feeder

Inland Airways of Walla Walla, Wash., operating a feeder service between that city and Seattle, Wash., has elected Lyle Neff of Pasco, Wash., as president, with Gerwyn Jones vice president and Paul R. Roesch secretary-treasurer.

The first year of operation was not profitable, but the last two months have been satisfactory, according to the report of H. Maurice Ahlquist, general manager. Traffic for the first three weeks of April was double the same period last year and 126 per cent over the previous month.

Russell B. Swartz, formerly chief pilot for Northern Airlines of Seattle, has been secured as operations manager for Inland, Ahlquist said.

Irish Connies Sold

Aerlinte Eireann (Irish Air Lines) has sold BOAC the five new-type Constellations with which it had planned to inaugurate service to the U.S. last March. Purchase price was around $6,300,000. BOAC intends to use the planes on its England-Australia run.

Sightseeing Tours New Income Source

Port of New York Authority has hit upon a novel way of adding to an airline terminal's revenue by granting Aeronautical Exhibits, Inc., a permit to operate guided tours at La Guardia Airport.

The company pays the Port of New York Authority 25 percent of the gross, plus a rental for counter space amounting to $150 per month. Six girl guides, each escorting a group comprising 15 or 20 people at a cost of $1.00 per person, conduct tours daily at 10-15 minute intervals.

▶**One-Hour Tour** — Each tour takes about an hour and includes a visit to the domestic terminal building, where rotunda facilities, loading platform, ticket office, and weather-station activities are demonstrated. Group is then escorted to the "captain's walk" on the roof of the terminal building to see four miles of runway and taxi strips, the control tower, ILS and GCA units, and domestic airlines' hangars. The tour is topped off with a visit to one of the hangars where the group can watch aircraft maintenance and overhaul procedures.

Aeronautical Exhibits, Inc., also has plans for an aviation museum to be located at the New York International Airport.

Airlines Question Idlewild Operation

A CAA report that proposed temporary operation of New York International Airport satisfies all safety requirements in landing has been contested by the Air Transport Association, representing all United States carriers currently using La Guardia.

▶**First Blow-Up**—It was the first in a series of expected blow-ups between airport management and control and the airlines which must vacate La Guardia.

Representatives of CAA, the New York Port Authority and the airlines had met in an effort to resolve any objections to the proposed limited operation of International Airport after July 1, when foreign air carriers are scheduled to use the facility.

▶**ATA Contention**—ATA maintained that the feeding of planes into both La Guardia and International during periods of minimum weather would slow up the handling of aircraft to the point where the association "can accept no responsibility to anyone, including the public, if the capacity of La Guardia Field is lowered."

CAA contends that its report, made after a three-year survey, had as its prime function the establishment of procedures which would permit simultaneous landings at the two fields during instrument weather.

▶**Temporary Procedure**—ATA told the joint conference that the proposed air pattern would result in additional holding of planes in the air, and that since the association was interested primarily in moving planes in and out of airports, the CAA temporary procedure "won't do."

Meanwhile, the airlines are priming themselves for a go-around with the Port Authority. They have secured the services of a public relations firm in New York, and the fur is expected to fly when the Port Authority orders the domestic airlines to move from La Guardia to New York International Airport.

The airlines are expected to take public issue with Port Authority policy on leases and gasoline distribution. Port Authority plan now is for airlines to pay on a published-tariff basis, subject to change at the discretion of the Authority.

PAA Seeks Mail Pay Boost in Latin America

Pan American Airways has taken steps to put its Latin American services back on a profitable basis, and in a position to make money.

With a $640,000 net loss on the books for the Latin American division in 1947, the carrier has asked CAB to raise its mail rate to compensate for higher costs. Last year, PAA points out, it received mail pay averaging 6.5 cents a revenue plane mile. By comparison, it says, CAB has established temporary rates of 95 cents a plane mile for Chicago & Southern Air Lines' New Orleans-Havana run and for Braniff Airways' proposed operations to Latin America.

Early CAB Decision Could Help CEA

California Eastern Airways, which recently filed a petition in bankruptcy, is looking to a favorable CAB decision in the pending airfreight route case as the means of solving its present financial problems.

Suspension of covering policies by creditor insurance companies forced CEA to halt operations this month despite the carrier's struggle to maintain service until CAB granted or denied the cargo line's application for a certificate of public convenience and necessity.

Feeling exists that if the Board awards CEA a certificate early in June, creditor tension will lessen and a reorganization will be possible at a meeting in Wilmington, Del., June 14. But in view of CAB's action late this month in ordering all freight route applicants to file special financial and operational reports by June 10, a board decision by June 14 seems unlikely.

▶**C-54s to Slick**—The day following the insurance creditors' move, California Eastern leased two of its C-54s to Slick Airways. The planes are being manned by CEA crews. Another C-54 reportedly was sold to the Argentine government, and California Eastern is retaining two planes at its Oakland, Calif., headquarters.

Slick's handling of CEA's traffic began for an initial period of 30 days from May 15. Subject to some inevitable transfers of business to other cargo carriers, CEA has placed with Slick a business volume which has been averaging about 800,000 lb. monthly. The lease to Slick brought CEA ready cash sufficient to maintain the latter's administrative and operations staff pending solution of the current financial problems.

AERO COMMANDER'S FIRST FLIGHT

The new seven passenger, twin engine light transport Aero Commander is shown in its first successful flight from Hughes Aircraft Co. field at Culver City, Calif. T. R. Smith, designer of the aircraft and president of Aero Design and Engineering Co., reports a 600-ft. takeoff in eight seconds, and an 1800 ft./min. initial climb. Landing speed was 56 mph. Indications are that the craft will show a top speed of 210 mph. Smith says that the cabin sound level is lower than that of a Bonanza personal plane. Tests have been limited to 60 percent power due to the limitations of fixed pitch propellers, which will be exchanged for variable pitch props.

ALL AGES FLY IN HAWAII

More passengers and more income for 1947, but lower profits. So reports Hawaiian Airlines, shown unloading a plane at Honolulu. Revenue passengers in 1947 totaled 314,608, 25 percent above 1946. Revenue reached $3,353,912, 16 percent higher than 1946. But costs climbed faster to $3,167,443—an increase of 25 percent over 1946, leaving a net profit after taxes of $126,795, down $61,428 from the previous year. Despite a $107,075 jump in revenue, the carrier's air cargo division operated at a loss of $61,000. The airline carried more than 300,000 passengers in 1947, and 1948 figures already reported indicate passenger increases each month.

Cargo Committee

Formation of an Air Cargo Project Committee on a permanent basis is California's solution to problems of large-scale cargo handling by air.

Representatives of certificated airlines, nonscheduled air carriers, aircraft manufacturers, shippers, packagers, and various other groups make up the committee which is probably the first set-up of its kind to take positive action in air cargo's direction.

The committee, which is under the sponsorship of the California Aeronautics Commission, has adopted the following objectives:

- To foster and encourage research in more efficient and economical handling and shipping of cargo by air, including development of new products which can be shipped by air.
- To maintain continued cooperation, through this committee, of all branches of the aviation industry, and allied industries concerned with air cargo, including agriculture, packaging, refrigeration, merchandising, etc.
- To coordinate and evaluate all existing information on the subject of air cargo, to avoid duplication of previous effort.
- To obtain cooperation of all concerned for experiments in regularly scheduled shipments of agricultural produce to eastern markets.
- To encourage development of new aircraft designed for more economical carrying of cargo.

Officers elected by the new organization are J. Prescott Blount, Mill Valley, representing Slick Airways, chairman; John P. Houghton, San Francisco, district manager of Air Cargo, Inc., vice chairman; and Lyman S. Lantz, Sacramento, chief of the division of aeronautical development of the California Aeronautics Commission, secretary.

TWA Relief

A retroactive boost in mail rates for its overseas routes has again enabled TWA to steer clear of the financial rocks (page 32).

The $1,100,000 which the carrier needed to meet a payment due May 28 on a $40,000,000 debt to the Equitable Life Assurance Society was provided in a CAB show cause order issued May 20. CAB officials said it was a "coincidence" that the additional yield of the new mail rate satisfied almost to the dollar TWA's need for cash to meet the Equitable obligation.

CAB's show cause order proposed a 60 cents a plane mile mail rate retroactive to Jan. 1, 1948, for TWA's overseas services. This would yield the carrier about $6,300,000 in international mail pay this year compared to $3,000,000 under the former scale. The retroactive increase through Apr. 30 is $1,100,000.

TWA on Apr. 13 had asked CAB to increase its overseas mail rate to 50 cents a plane mile retroactive to Feb. 5, 1946 (when trans-Atlantic operations were inaugurated), or to make an adjustment which would result in an immediate cash payment of $3,000,000. CAB stated, however, that an increase prior to Jan. 1, 1948, is not justified on the basis of available data.

NAL Pilot Study

National Airlines has made public new statistics intended to show that its non-union flight crews are as well qualified to fly its transports as the striking ALPA members.

Present non-union pilots had averaged 4644 hr. flying experience as of Apr. 20, compared to 4526 hr. for the pilots who walked out Feb. 3, National reported (AVIATION WEEK, Mar. 15). All but six of the new pilots are World War II veterans.

Records of previous experience showed 13 from American Airlines, 11 from TWA, eight from Pan American, four each from Capital and TACA, three from Panagra, two each from Braniff, Western, Northwest and Peruvian International, and others from United, KLM, Air France, China National, Santa Fe Skyway, Flying Tiger Line, California Eastern and Southwest. National states that most of its new pilots were members of ALPA when they flew for other scheduled carriers.

Emergency Board Meets In NAL Pilots' Strike

First meeting of President Truman's emergency fact-finding board seeking settlement of the National Airlines pilot strike was scheduled in Washington last week. Prospects for immediate termination of the walkout appeared slim as the sessions began.

Shortly after appointment of the board (AVIATION WEEK, May 24), NAL President G. T. Baker announced that he does not intend to re-employ Air Line Pilots Association members who went on strike Feb. 3 except when vacancies occur. Baker reaffirmed his position that non-union pilots hired to fill posts left by ALPA members are "permanent employes."

Meanwhile, National's new pilots have named a committee to draft a provisional seniority list. They are working under terms of the contract which existed between ALPA and NAL, according to Baker.

Smaller Loss in '48 Forecast by PCA

Capital Airlines (PCA) envisions a considerably smaller loss in 1948 than was experienced in 1947, but a profit this year apparently is out of the question without increased mail pay.

Under present mail rates, PCA anticipates a net loss of about $1,059,000 in 1948. This compares with a net deficit of $2,652,265 in 1947 and a $2,951,344 loss in 1946.

▶**Deficit Reduced**—The carrier's first quarter 1948 loss will be well under the deficit for the same period last year. January deficit was $401,576, February $489,238 and March about $317,000. Loss for April is expected to approach $136,000, after which profits are anticipated from May through September. Deficits are expected again during the last three months of the year.

In its annual report, PCA pointed out that steadily increasing wages and prices largely offset rigid economies last year. Eighty-eight percent of the 1947 deficit was incurred during the first quarter of the year. The company flew 1,100,500 passengers in 1947, against 1,343,900 in 1946, the decline being attributed largely to the series of major accidents last spring.

▶**New Planes** — Acquisition of new equipment represents one of PCA's major problems in 1948. Financial setbacks forced cancellation of the company's contracts for 20 Martin 2-0-2s and of its DC-6 order early last year. PCA officials are studying postwar planes now on the market together with others still being developed, and means of financing an equipment purchase are being considered.

CAB SCHEDULE

June 1—Oral argument in freight forwarder case. (Docket 681, et al.)

June 3—Hearing in Board's investigation of consolidated airfreight tariff agreement. (Docket 2719, et al.)

June 4—Prehearing conference on feeder aspects of reopened Mississippi Valley Area case. (Docket 548, et al.)

June 17—Oral argument on reopened portion of Mississippi Valley Area case dealing with selection of carrier on Kansas City-St. Louis route. (Docket 548, et al.)

June 28—Hearing on Pan American Airways Pacific certificate amendment case. (Docket 2953, et al.)

June 30—Hearing on Board's investigation of Pan American Airways' Miami-St. Thomas tariffs. (Docket 3274.)

July 12—Hearing on Capital Airlines mail rate case. (Docket 484.)

July 12—Hearing on National Airlines route consolidation case. (Docket 2967.)

Aug. 2—Hearing on Board's investigation of free and reduced rate transportation. (Docket 2737, et al.)

PICTURE CREDITS

Flight—34; McGraw-Hill World News—30; NACA—14; Press Assn.—12; A. U. Schmidt—35.

SHORTLINES

▶**American**—Had 41 of its DC-6s back in service by May 20 and expects to have its full 50-plane fleet available this week. Seventeen of the company's 75 Convair-Liners had been received by May 20. First scheduled passenger service with the new planes is to start June 1. All Convair-Liner deliveries to AA will be completed early next year.

▶**KLM**—A company DC-6 was severely damaged at Schiphol Airport, Amsterdam, this month while undergoing a simulated emergency three-engine takeoff procedure. Crew members were uninjured. Plane struck an embankment at end of runway.

▶**Northeast**—Last week was scheduled to inaugurate daily service between New York and Burlington, Vt., via Springfield-Hartford, Keene, N. H., White River Junction and Montpelier-Barre, Vt. . . . Carrier has asked CAB permission to suspend its Moncton, N. B., Canada, service indefinitely.

▶**Pacific Overseas**—Started flying 1500 fishermen and cannery workers from California, Oregon and Washington to Naknek, Alaska, for the summer season. To get the men there in time for the opening of the season, POA has subcontracted part of the traffic to Transocean Air Lines. Trips north will be completed by June 20, with return flights starting July 15. Seven C-54s will make 68 roundtrips.

▶**Pan American**—Special summer excursion fares to the Caribbean area, Mexico and Guatemala become effective June 2. Valid for 21 days, tickets offer savings of better than 30 percent until Sept. 30.

▶**Pioneer** — Inaugurates daily service from Amarillo to El Paso, Tex., via Clovis and Roswell, N. M., on June 1.

▶**Slick** — Moving 7,000,000 tomato plants in planeload lots from south Texas to Pennsylvania, New Jersey and Illinois.

▶**Trans-Canada** — Inaugurated direct service from Montreal and Toronto to Bermuda with DC-4Ms.

▶**Trans-Texas**—Scheduled to start service to Beaumont, Galveston and Lufkin, Tex., this month, to El Paso June 10.

▶**TWA** — One-plane service between Detroit and Atlanta will be inaugurated June 1 through an equipment interchange agreement with Delta Air Lines. TWA crews will fly the planes from Detroit to Cincinnati, where Delta crews will take over for the remainder of the trip over its routes to the south. The process will be reversed on northbound flights.

▶**United** — Revenue passenger miles flown in April were down 2½ percent from the same month last year.

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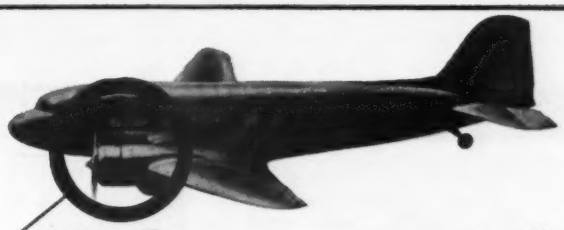

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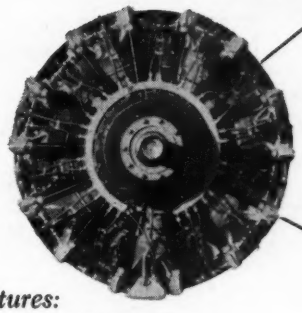

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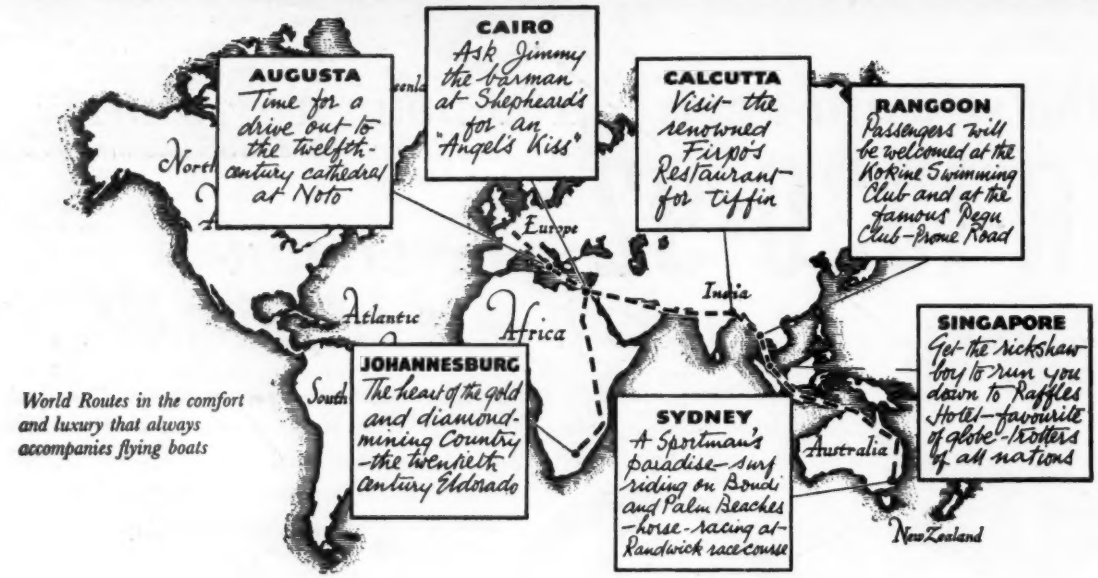
Some Short jottings for airline operators and their crews


AUGUSTA
Time for a drive out to the twelfth-century cathedral at Noto
CAIRO
Ask Jimmy the barman at Shepheard's for an "Angel's Kiss"
CALCUTTA
Visit the renowned Firpo's Restaurant for tiffin
RANGOON
Passengers will be welcomed at the Rokine Swimming Club and at the famous Pegu Club—Prome Road
SINGAPORE
Get the rickshaw-boy to run you down to Raffles Hotel—favourite of globe-trotters of all nations
JOHANNESBURG
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SYDNEY
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Europe
India
Atlantic
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World Routes in the comfort and luxury that always accompanies flying boats

What does the modern business man want . . . ?

Who says he's in a hurry?

As air travel becomes more and more an everyday affair the popular press announce one startling record after another for reduced times between various terminals. In order to stress the importance of these facts, the press has had also to produce someone who really wanted to move about the world at these record speeds, and who fitted the bill better than the "modern business man"? He, with vast demands on his time in all parts of the world, would appear to be just the man who would be prepared to sacrifice any amount of comfort for *speed*.

Has he asked for speed?

Experienced operators of airlines, such as Imperial Airways before the war and now B.O.A.C., have dealt with every type of passenger over many years. They feel that if this type of business man exists at all he is so rare as to be almost legendary. They have other, and quite different, ideas of what the modern business man requires on his long or short journeys, by air. He wants to *waste* no time; travel in comfort, and have as pleasant a break from business routine as possible.

How to get him there on time . . .

No time is wasted where schedules can be rigidly kept and this can be achieved more easily, we suggest, with a fleet of flying boats than with any other type of aircraft. Business men—and any other passengers for that matter—want to know that they will arrive at a given place at a given time and be able to work their appointments to match. If they also have time at the intermediate stops either to enjoy themselves or do other business, so much the better.

How to make him comfortable

Give him plenty of room. Don't cramp him. Give him a cabin with not more than about five fellow passengers whose faces he can see—he doesn't want to watch the backs of their necks, or the backs of their chairs, possibly for days. Give him large windows with a wide view of passing scenery. He'll get all these and a separate promenade cabin and cocktail bar—room to move about and a changing atmosphere and view—in a Short flying boat. Soon he'll find it's fun to fly by flying boat and it's a habit that sticks.

Shorts THE FIRST MANUFACTURERS OF AIRCRAFT IN THE WORLD

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FLYING BOAT PERSONALITIES

Captain A. Le R. S. UPTON, B.O.A.C.

CAPTAIN UPTON has, until recently, been operating on the routes with the Short Empire "C" Class Flying Boats upon which he was employed during their entire service with Imperial Airways and later B.O.A.C. He is now engaged on instructional duties with Short Hythes and Plymouths.

His flying career began in 1927, when he flew Avro 504Ks with the R.A.F. Later, he had his first taste of "marine aircraft" with the Fleet Air Arm, flying Blackburn Blackburns and 3Fs.

Captain Upton was one of the B.O.A.C. captains who assisted in the evacuation of Crete, camouflaged "C" class boats being used for the job.

ADVERTISERS INDEX

AVIATION WEEK

MAY 31, 1948

Axelson Manufacturing Co. 4
Agency—Heintz & Co., Inc.

Bridgeport Fabrics, Inc. 24
Agency—Henry A. Loudon Adv.

Eclipse-Pioneer Div. of Bendix Aviation Corp. 20
Agency—MacManus, John & Adams, Inc.

Garrett Corporation, The 28
Agency—J. Walter Thompson Co.

Goodyear Tire & Rubber Co., Inc. ..Front Cover
Agency—Kudner Agency, Inc.

Greer Hydraulics, Inc. 26
Agency—S. Vogel Advertising

Grumman Aircraft Engineering Corp. Fourth Cover
Agency—Charles W. Hoyt Co., Inc.

Hydro Aire, Inc. 6
Agency—John H. Riordan Co.

Minneapolis-Honeywell Regulator Co. Second Cover
Agency—Addison, Lewis & Associates

Pesco Products Co. .....Third Cover
Agency—Fuller & Smith & Ross, Inc.

Ryan Aeronautical Co. 7
Agency—Batten, Barton, Durstine & Osborn, Inc.

Searchlight Section 38, 39

Short Brothers & Harland, Ltd. 40
Agency—J. Walter Thompson Co., Ltd.

Skinner Purifiers Div. of Bendix Aviation Corp. 10
Agency—MacManus, John & Adams, Inc.

Socony-Vacuum Oil Co., Inc. 19
Agency—Compton Advertising, Inc.

Sperry Gyroscope Co. 8
Agency—Charles Dallas Reach Co., Inc.

Surface Combustion Corp. 5
Agency—The Griswold-Eshleman Co.

Tennes, H. E. 38

Utica Drop Forge & Tool Corp. 37
Agency—Deveruex & Co., Inc.

Western Gear Works 41
Agency—West-Marquis, Inc.

Wright Aeronautical Corp. 3
Agency—Charles Dallas Reach Co., Inc.

▲

SEARCHLIGHT SECTION

(Classified Advertising)

EMPLOYMENT
Positions Vacant 38
Selling Opportunity Offered 38
Positions Wanted 38

SPECIAL SERVICES
Contract Work 38

EDUCATIONAL
Schools 38

PLANES—EQUIPMENT
(Used or Surplus New)
For Sale 38, 39

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4814

GEAR PRODUCTS

LETTERS

(We are giving our readers a week's vacation from editorials, and present some of our more interesting mail which has been omitted by space limitation—The Editor)

Hy Sheridan Commentates

To the Editor:

What are we coming to when the doughty aviation editor of the celestial Saturday Evening Post admits that he doesn't know the difference between a motor and an engine, as he did in your Letters section Apr. 15? I shall be glad to remove his anxiety. Since this is a technical matter it should be handled in the orthodox aeronautical engineering way, and I am in negotiation with some numerologists and when I get the figures I shall work the matter out with calculus and tensors and then send the results to your noble paper as an article.

Hy

In the meantime, please tell the editor mentioned above, Mr. Wesley Price, not to let the meaning of a word have any influence upon his work—the other editors of the Post don't.

Yours for Sadie the Stewardess, who says that as far as she can make out a writer is just a pander for a dictionary, anyway,

HIRAM WILSON SHERIDAN
(Famous author & Bon Tout)
Oak Park, Illinois

That Refueling Claim

To the Editor:

In a recent issue a correspondent disputed a claim made for the B-29 of an endurance record without refueling in the air, and claimed the record for the Martin Mars.

Both writers seem to have forgotten the endurance record made by Walter E. Lees and Frederick A. Brossy at Jacksonville, Fla., when they flew a Packard Diesel engined Bellanca for 84½ hours, May 25 to 28, 1931.

DENIS F. CASHMAN
402 Edgewood Ave.
Dayton 7, Ohio

Oakland Accomplishments

To the Editor:

We note with interest your items on use of GCA and Instrument Landing systems. Listed below are two items that are quite unique in aviation news. As you may not know, here at the Oakland Airport are installed the CAA ILS and the Navy's GCA unit No. 19. We have parallel runways, 27 Right and 27 Left; ILS on 27 R, and GCA on 28 L. This set-up is one of very few also.

On Jan. 8, an Air Force C-47 (AF 7280) made a GCA approach with the visibility one-quarter mile, ground fog. Thirty seconds later another C-47 from the Landing Aids Station at Arcata, Calif., made an ILS approach, same visibility. The top of the ground fog was about 300 ft. and both pilots were aware of each other. GCA also had each ship in view in the radar scope.

On Jan. 22, Air Force 8078, C-47 from Landing Aids Station at Arcata, Calif., made an ILS approach in zero-zero weather. Thirty minutes later he departed with the same weather conditions. From the tower the visibility was less than twenty feet. After the aircraft had landed, the airport truck could not find him on the runway and the pilot had to find the ramp by his own methods.

ROBERT F. O'NEIL
Airport Traffic Controller
Oakland (Calif.) Municipal Airport

Comment From England

To the Editor:

In your issue of Dec. 22 you ask your readers to send in their thought about your publication. This I am glad to do.

I have no criticisms. It is, in my view, far the best of the United States' aircraft publications and the reasons for expressing such an opinion are:

1. It is published weekly and the news is, therefore, up to the minute.
2. It is well informed and the news is comprehensive.
3. It is well balanced.
4. Although, as you say, it carries a great deal of advertising, yet the advertising does not swamp the book.
5. If ever I was asked to criticize the magnificent periodical publications of the United States, I would do so for one reason only, that of starting the stories on the early pages and sandwiching the remainder at the end between hordes of advertising matter. Please do not be forced into this practice!
6. I enjoy the broad labour approach.

E. EARNSHAW
Director and General Manager
Rotax Ltd.
London, England

St. Louis Council's Precedent

To the Editor:

I was interested in your research report on the new National Air Council. . . . It would be timely, perhaps, to draw a parallel of this national group with the metropolitan council which has been in operation in the St. Louis area for two years.

Our Aviation Council grew out of the postwar confusion which existed in governmental administration of aviation matters, in the diversified interests of many civic and educational groups, and in the ramified objectives of various aviation groups.

George B. Logan, prominent corporate attorney and aviation enthusiast, took the leadership in bringing together all groups under a common purpose of building aviation as an economic and social force of great importance to this area.

Originally, there were only 38 incorporating groups, all non-profit civic and service clubs and business associations; now there are in addition to these groups some 150 corporations and many individuals in the membership. The roster is impressive, a cross-section of the most progressive clubs, businesses and aviation groups. Maj. Gen. Leif J. Sverdrup is president.

With a small budget and small paid staff, the Council has chalked up considerable success in its short history. It has blueprinted a program of aviation development for the area; stimulated interest in a bi-state air authority; organized and supervised goodwill flights; promoted a month-long "visit your airports" tour program; provided speakers on airfreight; assisted in organization of military air reserve groups; aided in many air education matters.

The Council decided that air safety was vital to healthy growth of the industry. Its down-to-earth Airport Safety Code for local airports gained national recognition and the code, as well as the Council itself, has been used for local adaptation elsewhere. . . .

The Aviation Council of Metropolitan St. Louis, Inc., has effectively demonstrated the strength of cooperative effort on the grassroots level. It is, of course, at this level where support of national programs and policy must be generated. For this reason, such groups as the new NAC can and should provide extensive cooperation to such ready-made vehicles as the St. Louis Council.

Little Starling Airport on the outskirts of south St. Louis may seem a long way from the halls of Congress, but there is a much more direct connection than many people realize, a connection which taps almost every possible phase of aviation development.

ROBERT A. WILLIER
Public Relations Counsel
Aviation Council of Metropolitan
St. Louis, Inc.

College Praises Letter

To the Editor:

I am grateful for the clear statements contained in William G. Briegleb's letter, published in AVIATION WEEK May 3. The page containing his letter has been placed on our students bulletin board, and the letter is being read to both engineering and ground school classes. We would appreciate permission to reproduce this letter in enlarged photostat copy and also in page form for distribution to students.

Our students operate a flying club and gliding clubs, and this department operates a Boeing N2S5. The writer collaborated with Prof. R. H. Upson in development of the Wayne University stall warning indicator which was extensively tested and then approved by CAA under direction of A. L. Morse of the experimental station, Indianapolis . . .

ARTHUR A. LOCKE, Chairman
Dept. of Aeronautical Engineering
College of Engineering
Wayne University
Detroit, Michigan

WE FED IT

TRYING TO SHEAR THE MAIN PUMP DRIVE GEAR

. . . to test the safety factor of this high-pressure fuel pump

When you're taking off in a jet job you just can't let the "fire" go out in the engine.

That's why Pesco engineers have developed a high-pressure fuel pump with two pumping sections, one for the main fuel system and the other for the secondary system that automatically goes into operation . . . just in case! And that's why these same engineers really gave this pump the works in testing it, and fed, into the suction side, such surprising materials as brass rod, a steel washer, steel nut, steel screw, lead pellet, brass wire, galvanized wire and other assorted "junk". What happened? All of these materials passed through the pump to the discharge outlet after being cut up by the gear teeth . . . or because of their size and contour, stayed on the suction side, being constantly repelled by the gear teeth. Only when piano wire wrapped itself around the gear did the gear seize. It was a pretty tough test. But then this Pesco High-Pressure Fuel Pump is built for really tough service.

Actually, this latest Pesco development is really two pumps in one. There is a common inlet, but two separate discharges and two drive shafts . . . one inside the other. If the main fuel system pump fails, the other automatically goes into action . . . and the all-important fuel continues to reach the engine . . . at the same capacity and same pressure as delivered by the main pump.

Pesco High-Pressure Tandem Fuel Pumps have been developed for jet engine fuel systems operating at pressure of from 500 to 1,000 p.s.i.

For complete information write Dept. 5-5B.

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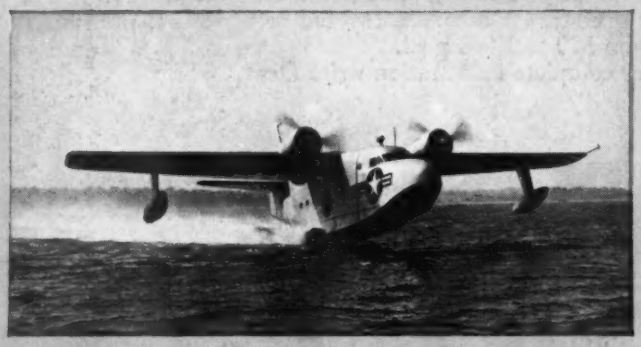
THE GRUMMAN MALLARD—Choice of businessmen and sportsmen, the Grumman Mallard provides a greater degree of comfort and safety than is obtainable in any other private plane. This beautiful twin-engine amphibian is licensed for 8 to 10 passengers.

THE GRUMMAN PANTHER—Newest Jet fighter for the U. S. Navy is designed to operate from land or carrier bases. Outstanding construction features permit very short takeoffs and landings and include innovations in wing and cockpit. Capable of extremely high speeds, the Panther is equipped with the most powerful turbo-jet engine in the world.



THE GRUMMAN ALBATROSS—Built for the U. S. Navy, the Albatross is the largest of Grumman amphibians. Powered by two 1,425 horsepower engines, this versatile plane is designed for rough water operation. Planned for air-rescue or cargo transport it carries a crew of three and sixteen litter passengers, or two tons of cargo. The Albatross has a cruising speed of 225 miles per hour.

Grumman

GRUMMAN AIRCRAFT ENGINEERING CORPORATION, Bethpage, Long Island, New York